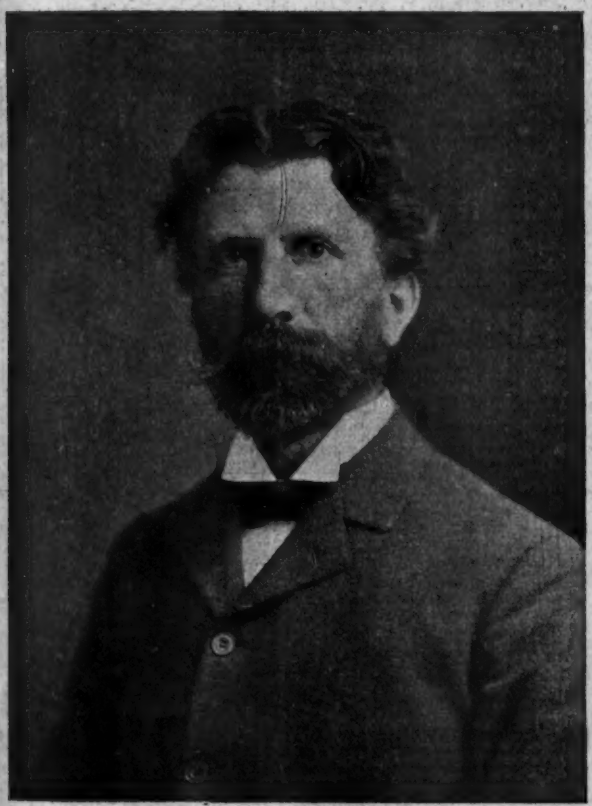
McVITIE & PRICE'S OATCAKES.

THE PRACTICAL TEACHER



MR. J. LIBERTY TADD.

CONTENTS

OF THE

MAY NUMBER.

THE JUDGMENT "ACCORDING TO COCKER"-TON. By J. H. Yoxall, M.P. 549
PRACTICAL TEACHERS AT GREAT YARMOUTH. The Thirty-second Annual Conference of the N.U.T. 552
SIMPLIFIED FRENCH SYNTAX 563
THE KING'S FIRST CODE 564
MR. J. LIBERTY TADD AND NEW METHODS IN ART AND MANUAL TRAINING 565
BY MANY HANDS 568
NOTES FROM THE NORTH 570
NOTES ON AMERICAN PRIMARY EDUCATION 571
THE LATE REIGN 572
OUR EMPIRE SUPPLEMENTS—
4. THE COMMONWEALTH OF AUSTRALIA 574
PRACTICAL ELEMENTARY SCIENCE 576
OUR ILLUSTRATED GEOGRAPHICAL NOTEBOOK 578
KINDERGARTEN GIFTS AND OCCUPATIONS IN AN ELEMENTARY SCHOOL 580
HISTORY UNDER THE PRESENT CODE 581
AN INFANT SCHOOL TIME-TABLE 582
OUR PUPIL TEACHERS' AND SCHOLARSHIP COURSE. By A. T. Flux 583
OUR CERTIFICATE COURSE FOR 1901. By G. Collar, B.Sc. 588
LONDON MATRICULATION. By R. C. B. Kerin, B.A. 591
OUR QUERY COLUMN 594
PHYSIOGRAPHY 597
CHEMISTRY NOTES 598
ELECTRICITY AND MAGNETISM 599
THEORETICAL MECHANICS 600
OUR FRENCH PRIZE COMPETITION 601
THE EDITOR'S TABLE 602

VOL. XXI
No. II

EDITORIAL, PUBLISHING AND ADVERTISING OFFICES OF "THE PRACTICAL TEACHER"
35 & 36 PATERNOSTER ROW, LONDON, E.C.
NEW YORK OFFICE, 37 EAST EIGHTEENTH STREET.

PRICE 6D.

FRY'S PURE CONCENTRATED COCOA.

NEW EDITIONS
of the

ENGLISH. SCHOOL. CLASSICS

Published by

MOFFATT & PAIGE, Ltd.

The Traveller (Goldsmith). Price **3d.**
Cowper: Expostulation. Price **4d.**
Elegy in a Country Churchyard,
The Progress of Poesy,
The Bard,
Ode on a Distant Prospect, etc.
} In one Book, **4d.**
Essay on Milton (Macaulay). Price **1s. 6d.**

THE PLAYS OF SHAKESPEARE.

Contents.—Chief Events in the Life of Shakespeare—Shakespeare's Works—Introduction—Date and Early Editions—Source of the Plot—Sketch of the Plot—Sketches of the Principal Characters—Literary Notes—Notable Passages—Proverbial Expressions and Familiar Quotations—The Text—Miscellaneous Notes—Notes on the Language of the Play—Etymological Notes—Proper Names—Examples of Paraphrasing—Examples of Analysis of Sentences—Anachronisms and a few Typical Questions selected from various Examinations.

	s.	d.		s.	d.
AS YOU LIKE IT, ...	2	0	MERCHANT OF VENICE,	1	6
CORIOLANUS, ...	2	6	MIDSUMMER NIGHT'S DREAM, ...	2	0
HAMLET, ...	2	6	RICHARD THE SECOND,	1	6
HENRY V., ...	2	6	TEMPEST, ...	2	0
JULIUS CÆSAR, ...	2	0	TWELFTH NIGHT, ..	1	6
KING JOHN, ...	2	0			
KING LEAR, ...	2	0			

BACON.

Schoolmaster.—"The edition will stand as an exemplar."

	s.	d.
BACON'S ESSAYS. Part I., ...	2	6

Essays I.-XXVI., with Life, Introduction, Notes arranged and classified, Analysing, Paraphrasing, Indexes, etc.

MILTON.

Practical Teacher.—"Marked by those features of almost exhaustive annotation and complete classification of information on which we have commented in our notices of Shakespeare's plays, edited by the same practical hand."

	s.	d.
SAMSON AGONISTES, ...	2	0
COMUS, ...	1	6
LYCIDAS, L'ALLEGRO, and IL PENSEROSO, ..	1	4

EXAMINATIONS FOR TEACHERS' CERTIFICATES.

Male and Female, 1902.

	s.	d.
GEOGRAPHY OF EUROPE, ...	1	6
MACBETH, ...	1	6
PARADISE LOST. Books 1 and 2, ...	2	0
THE ENGLISH LANGUAGE: Its Source and Growth, ...	1	6

4 PEMBERTON ROW, GOUGH SQUARE, LONDON, E.C.

MESSRS. BELL'S NEW BOOKS.

EDUCATIONAL CATALOGUE POST FREE ON APPLICATION.

Parts I. and II. Now Ready.

Crown 8vo, each with 4 Coloured Plates and numerous other Illustrations. Price 1s. 6d. each.

BELL'S LATIN COURSE

FOR THE FIRST YEAR. IN THREE PARTS.

By E. C. MARCHANT, M.A., and J. G. SPENCER, B.A.,
Assistant Master in St. Paul's Preparatory School.

"The book is skilfully devised not only to teach a youngster the elements of Latin, but to win him naturally to an interest in the subject."—*Scotsman.*
"If learning the elements of Latin can be made attractive to small boys, Messrs. Marchant and Spencer have discovered the method."—*School Guardian.*
"We consider this a very serviceable first practice book for boys and girls."—*Educational Times.*

BELL'S ILLUSTRATED CLASSICS.

NEW VOLUMES.

ELEMENTARY SERIES.

With or without Vocabulary, 1s. 6d.

ELEGIAC SELECTIONS FROM OVID. Edited by F. Coverley Smith, B.A., Assistant Master at Nottingham High School. With numerous Illustrations.

GREEK PLAYS. 2s. each.

EURIPIDES.—ALCESTIS. Edited by E. H. Blakeney, M.A., Headmaster of Sir Roger Manwood's Grammar School, Sandwich.

EURIPIDES.—BACCHAE. Edited by G. M. Gwyther, M.A., Assistant Master at Plymouth College.

INTERMEDIATE SERIES.

THE AGRICOLA OF TACITUS. Edited, with Introduction and Notes, by J. W. E. Pearce, M.A., formerly Assistant Master in University College School. With numerous Illustrations of Roman Antiquities, etc., Maps and Plans. Crown 8vo, 2s.

READY IMMEDIATELY. In Five Parts. 8d. each.

EXERCISES IN LATIN SYNTAX. By L. D. Wainwright, M.A., Assistant Master at St. Paul's School. In Five Parts. 8d. each.

Part I. Ut, Ne, Quominus, Quin.
Part II. Conditional Sentences, with Dum and Dummodo.
Part III. Cum.
Part IV. Oratio Obliqua.
Part V. Qui, Utinam, Quasi, etc.

Crown 8vo, 3s. 6d.

PRÉCIS AND PRÉCIS WRITING. By A. W. Ready, B.A., Army and University Tutor, Scholar of Wadham College, Oxford; Author of "Essays and Essay Writing for Public Examinations."
In Part I. of this volume the Art of Précis Writing is explained.
Part II. contains a collection of Précis which have been set in the Army Examinations, and are here reprinted in full by special permission.
Part III. is a Key in which these Précis are fully worked out, with notes where necessary.

Crown 8vo, 3s. 6d. net.

HARROW. By J. Fischer Williams, M.A., Fellow of New College, Oxford. With 48 Illustrations. (*Bell's Great Public Schools.*

BOHN'S LIBRARIES.

NEW VOLUMES.

THE LETTERS OF THOMAS GRAY. Including the Correspondence of Gray and Mason. Edited, with an Introduction and Notes, by Duncan C. Tovey, Editor of "Gray and his Friends," etc. Vol. I. 3s. 6d.

THE HISTORY OF EARLY ITALIAN LITERATURE TO THE DEATH OF DANTE. Translated from the German of Adolf Gaspary, together with the Author's Additions to the Italian Translation (1887), and with Supplementary Biographical Notes (1887-1890), by Herman Oelsner, M.A., Ph.D. 3s. 6d.

CICERO'S LETTERS. A New and Complete Translation. By Evelyn S. Shuckburgh, M.A., Librarian and formerly Fellow of Emmanuel College, Cambridge. 4 Vols. 5s. each.

LONDON: GEORGE BELL & SONS,
York Street, Covent Garden.

BRITISH MUSEUM

THE

PRACTICAL TEACHER

A MONTHLY MAGAZINE AND REVIEW

FOR THE SCHOOL-ROOM AND THE STUDY

Vol. XXI. No. 11. MAY, 1901. Price 6d.

NOTICES TO CORRESPONDENTS AND SUBSCRIBERS.

☞ ***Subscribers who do not receive the SUPPLEMENT presented with this Number are asked to promptly communicate with us, and to send at the same time name and address of Bookseller or Newsagent through whom the Magazine is obtained.***

"The Practical Teacher" may be ordered of any Newsagent or Bookseller, or at any Bookstall in the United Kingdom or in the Colonies. Supplies are sent monthly to the chief towns in Australasia, South Africa, and India.

London Office: 35 and 36 Paternoster Row.
Edinburgh Office: Parkside Works.
New York Office: 37 East 18th Street.
Paris: Neal's Library, 248 Rue de Rivoli.
Berlin: Gselliusische Buchhandlung, Mohren Strasse.

Subscribers may obtain "The Practical Teacher," post free, from the Publishers at the following terms:—

United Kingdom, Continent, Colonies, and United States } 12 Months, 8/- 6 Months, 4/-

All literary communications should be addressed to Henry Scheurmier, Office of "The Practical Teacher," 35 and 36 Paternoster Row, London, E.C.

Remittances, Cheques, Post-Office Orders, etc., should be made payable to Thomas Nelson and Sons. Advertisement rates on application.

THE JUDGMENT "ACCORDING TO COCKER"-TON.

BY J. H. YOXALL, M.P.

"A FEW words on the Cockerton judgment" is the editorial request, and I can understand that some people would use a few words of a very pungent and explosive character indeed. But I am a convinced optimist: I believe that all things work together for good; and I am certain that the attack on the people's higher schools will ultimately fail. Democracy is said to be like the grave, in never yielding back; and Sir John Gorst was obliged to give me, in the House of Commons, the evening it adjourned, an assurance that no school now open and doing good work would be obliged to close its doors. And as to the higher schools not yet open, I say to the Camden School of Early Victorian Art and the Piffletown School of Latin Grammar, "Go to! Do you think you can mop back the Atlantic? You appeal to the law; well, we will *make* the law, and appeal to the commercial profits."

Mr. Hamilton of the London School Board has now a chance of descending by repute to posterity as the Hampden of the surcharge: let him refuse to pay the ship-money; let him go to prison rather; let him sacrifice a few days of liberty upon the altar of the people's schools. I think he comes of a Covenanter stock. What would a John Knox do in the present crisis—Knox, who planted the parochial school system in that superior portion of the island which is the brain of Great Britain? If a surcharged School Board member were to go to prison in defence of the people's schools, I think it would be more than the ventral portion of the island could stomach; it would shake even Sir John Gorst out of his cynical calm.

What has happened is only what happens again and again in every department of public life in poor blundering England. The Board of Education, under the Duke of Devonshire and Sir John Gorst, has come to be a War Office *in petto*. The usual history of a particular part of the public service in England is this:—

First.—A public duty is left unperformed by the organised public.

Second.—A private individual or private society philanthropically undertakes to perform that duty.

Third.—The law and the public conscience lumber along contentedly for a good many years, until, at last, Parliament, stung by repeated taunts, proposes to discharge the public duty which the private persons and societies have only been able to tinker at.

Fourth.—Parliament shifts the actual performance of the said duty upon the shoulders of a local authority.

Fifth.—The local people grumblingly take up the work, gradually become enthusiastic over it, and eventually overstep their legal powers.

Sixth.—The central authority winks—perceives the overstepping, but winks at it, in order to avoid the trouble of stopping it, or of moving the Government to take the trouble to ask Parliament to take the trouble to legalise the overstepping.

Seventh.—The private persons and societies find at length that their "one-hoss shays" of institutions are being outclassed, and their philanthropical little pet monopolies infringed upon by a public local authority.

Eighth.—There is much consulting of frowsy documents and mildewed charters, and a discovery that "really these elected people, you know, they are going it a bit too fast for anything."

Ninth.—The private persons and societies begin to protest, and around them gather all the Adullamites and sons of makeshift;

Next Month:
EDUCATIONAL HOLIDAY COURSES 1901.

all the men of Belial who perceive the wickedness of light and the evils of fresh air; and all the philosophical upholders of autocracy and privilege.

Tenth.—The law is jogged in the ribs, wakes up, examines the statutes and precedents, and puts on the black cap.

Eleventh.—Judicial murder of the innocents is performed, with absolute impartiality and legality.

Twelfth.—The nation begins to make a stir. Members of Parliament are pestered by numberless letters from troublesome constituents, questions and speeches occur in the House of Commons, and the Government introduces a Bill.

Net Result.—The nation undertakes to do, and begins to do, at last, the thing which less dunderheaded nations began to do nearly a century earlier. *V'la les Anglisches!*

And this is not the chronicle of the course of events here in education alone; *mutatis mutandis*, the course of events has been the same in matters of sanitation, military volunteering, hospitals, reformatories, ameliorative effort of all kinds almost. The judgment according to Cockerton is only the latest instance of a series much alike. And when one considers the domain of individualised public efforts for private gains, gas and water companies, railways, electric-lighting syndicates, telegraph companies, tramway companies, and what not, one sees that the present trouble, mess, and muddle between the School Boards and the Board of Education is only a pale reflex of the want of forethought and management shown by municipalities, the Local Government Board, and the Board of Trade.

I remember reading in a French *revue* of fifteen years ago the opinions of a distinguished foreigner long resident in England upon the English way of doing matters. He took as his type the construction of the underground railways—that was before the day of "tubes." He said that when the great English public set about making the iron roads underground, they did not begin on any intelligible system. First they made a section of railway from A (let us say) to B, then a section from C to D, then a section from E to F, and so on; and when they had made a lot of sections detached from each other, then, and not till then, did they begin to think of joining up all the sections into a cogent and convenient whole. The result of that is the quarrel and distraction of the Metropolitan and District systems; an inner circle that is not wholly inner, and an outer circle that is not a circle at all; the changing trains, the waits, the rival bookings, the roundabout way between two neighbouring points—all the result of beginning with no system and no looking ahead. "But," the distinguished foreigner added, "the English manage to arrive after all."

There it is: we manage to arrive; we blunder through it, as Lord Rosebery said of our wars. And we shall "arrive" in this matter of continuative and higher primary education in the end.

Convince our good slow-minded compatriots that there is a mess, a muddle, and an impending or existing catastrophe, and they put a breakdown gang upon the spot with at least as much readiness as any other great nation. I am rather glad that the Master of the Rolls not only confirmed Justices Wills and Kennedy, but went beyond them; I am rather glad that the dictum of the Master of the Rolls has nullified that elaborate sham (as it has been made to be by administration), the Higher Elementary School Minute. Because the thing required is for John Bull to be convinced that there is need for the breakdown gang to operate, and that speedily; and a partial breakdown is not enough to convince him of so much. I am glad that the Cockerton judgment—how easily Mr. Cockerton, the hitherto unknown, has attained to fame, with his distinguished patronymic in every newspaper day after day!—I am glad, I say, that the—the—*the* judgment has recoiled as much upon the Board of Education, directed by Sir John Gorst, as upon the School Boards. If the School Boards have not acted quite "according to Cocker," they acted with a good motive and for the weal of the land; while the Board of Education is revealed in the Law Courts as a Government bureau which, having encouraged the School Boards in their illegal course for many a year, suddenly turns round, under orders from its parliamentary heads, makes it almost impossible for School Boards to get science and art grants, and so opens the door of obstruction to that singularly patriotic and unselfish corporation, the Camden Incorporated (think of it with awe, ye Boards that are merely statutory!)—the Camden Incorporated School of Art. If the judgment shows anything quite clearly (which I doubt), it shows that the Duke of Devonshire and Sir John Gorst are, so far, anything but a success at the Board of Education.

What is the way out of the mess? What is the particular method of operations for the breakdown gang? That is now the question. Will Government grants be able to solve the difficulty?

I think not. Government grants for education are wary birds to catch. I have no doubt that nearly all the difficulty about the Higher Elementary School Minute results from a Treasury mandate that the Board of Education is not to allow higher elementary schools to come into existence over and above the present organised schools of science and art. "You may spend as much money under the Higher Elementary School Minute as you have been spending under the Science and Art Directory on organised science schools, and no more," seems to have been the command of that intolerably interfering institution, the Treasury; "but it must be the *same* money, paid out of the Whitehall pocket instead of the South Kensington pocket—that is all." The nation is pouring a million pounds a week into the channels of war in South Africa, but cannot afford £10,000 a year for new higher primary schools.

Well, I recognise facts; I try not to be unreasonable: I am not going to say that the nation can afford to buy a war and a higher elementary school at the same moment. And if the representative of the Board of Education would come down to the House of Commons and tell frankly, "We can't afford it at present," I would have little to say. But when Sir John Gorst stands up in the House, and, as an excuse for obeying the Treasury, talks about spherical trigonometry and differential calculus in the evening continuation schools, the dust he thus throws may blind the eyes of the M.P. who does not know the facts, but it only irritates mine. Better the rough blurter-out of unpleasant truth than the smooth, cunning sayer of parliamentary falsities. "We cannot afford it" is something of a rational excuse; but "we ought not to teach spherical trigonometry and differential calculus in evening continuation schools" is next door to a ——.

It matters little in practice, however, because I am afraid that Government grants, even if there were no war and money was plentiful, could not remedy the mischief. The difficulty is that the Cockerton judgments have disabled the School Boards from building loans and rate-maintenance of schools and classes that

BRITISH MUSEUM

might earn the grants if offered. What is in question is not the power of Government to give grants, but the legal right of School Boards and voluntary school committees to provide the venue. Alterations in the Code and increments of the grants will not suffice to solve the difficulty. Even the Higher Elementary School Minute, regarded only as a piece of printed paper, and apart from its central administration, is, I fancy, rendered null and void. The history of Sir John Gorst's fumblings with the Science and Art Directory and the higher-grade schools is worthy to be writ in the chronicles of the War Office; he has provided a gun without ammunition.

What, then, is to be done? Will the Government propose to legalise the School Boards and voluntary school committees as governing bodies capable of providing evening-school education for adults and day-school education for children above the standards? I think not. The underground policy of the political heads of the Board of Education for four or five years past has been to disable the School Boards administratively. Now, when that policy has resulted in educational dislocation and national uproar, it is hardly likely that the Government will reverse the helm. I think they will go on another tack; I fear that they may seek to hand over continuative education entirely to secondary education authorities. The Board of Education have allowed their house to be pulled down about their ears, and I cannot wonder if the Government should say that it must be rebuilt upon another site. But I fancy the Government remember 1896 too well to adventure upon a Bill that shall lay them open to the attacks that wrecked the Bill of that year. If the Government are bent upon legislation—and they can hardly avoid it—the path of safety for their Bill through the House of Commons has already been charted and buoyed: it lies along the line of compromise, as usual; it is a plan upon which most members of Parliament who count in educational debates in the House are already agreed.

What is it? First, a local secondary education authority should be set up; secondly, there should be a clause empowering that authority to take over the management of elementary education also, where the people of the locality desire it; thirdly, in order to invite the people of the locality to desire unification, there should be elasticity in the mode of constituting the local authority. Bradford demands that such an authority should be elected *ad rem;* Nottingham apparently does not; London requires exceptional treatment; Hampshire cannot be managed in the same way and by the same kind of local authority as those that are suitable for West Yorkshire. Each locality of considerable area or population might be left freedom, within certain statutory limits, to choose and plan its own form of local authority for education. And to this local authority powers and moneys to use for the benefit of all the local schools should be given. The primary school, elementary school, Board school (and perhaps the voluntary school) being managed by the same committee as the higher grade school, the grammar school, the school of art, and the technical school, no war of authority between School Board and technical authority would continue; no hiatus, no lack of co-ordination need exist; no quibble—legal or otherwise—between School Board rate, technical education rate, "whisky money," South Kensington grant, and Whitehall grant would then arrest or hinder the smooth flow of local educational effort. This is the specific against the evils of the judgment according to Cockerton which, I trust, the Government will prescribe. And I am certain that opinion in the House of Commons will endorse it.

"One and the same local authority for all forms of education in a district" is a principle I affirmed seven years ago. In 1895 I wrote a memorandum to be published with the Report of the Royal Commission on Secondary Education in England; the publication of my memorandum was the condition I attached to my signing the unanimous Report. Let me quote a little from it, in proof that I do not now adopt the plan recommended for the first time, or as the result of the activities of Mr. Cockerton.

"Identification of educational jurisdiction is, in my judgment, urgently needed in order to obtain the following objects:—

"1. *Economy of management,* by avoiding (*a*) multiplication of officials; (*b*) duplication of functions; (*c*) overlapping of authority; (*d*) oversupply of schools; (*e*) undue competition between authorities and schools.

"2. *Administrative efficiency,* by securing (*a*) systematised and continuous oversight; (*b*) accurate knowledge of interdependent requirements; (*c*) organic connection of curricula in primary and secondary schools; (*d*) definition of scope of various kinds of secondary schools; (*e*) systematic adjustment of schemes of scholarships and exhibitions; (*f*) organic relations between primary, secondary, and higher instruction.

"3. *Discouragement of unnecessary social prejudices* arising from (*a*) separatism in administration; (*b*) non-educational distinctions between schools; (*c*) want of unity in the teaching profession as a whole.

"There is hardly any price in the way of administrative readjustment or legislative reconstruction too high to pay for reforms so desirable in the public interest as these. A national system of education cannot be divided into water-tight compartments without every part of it being injured. From top to bottom it should be one thing, a living organism; and administrative bonds which check free circulation from one part of it to another lessen its vitality and endanger its natural growth."

The judgment according to Cockerton has cast a fierce light upon the ideas buried in a Bluebook six years ago; there is a resurrection of the ideas, and I think there is going to be an embodiment of them in a statute. If so, the judgment will be a blessing in disguise, and the fortunate Cockerton will go down to posterity as one of those who have blessed mankind unawares.

EDUCATION IN OUR COLONIES.

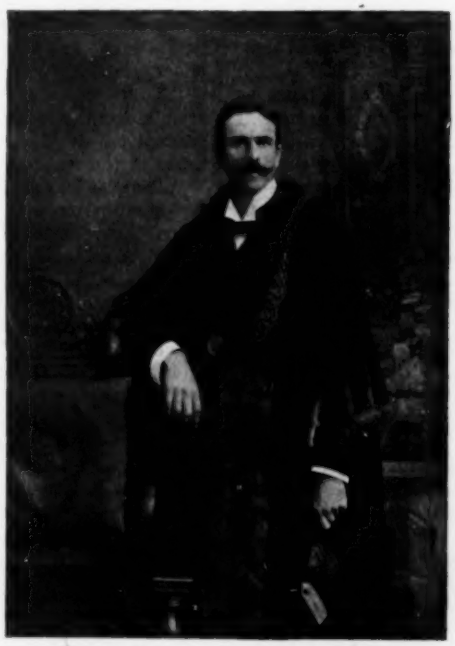
At the moment of going to press, we have before us two bulky volumes of special reports on educational subjects which have just been issued by the Board of Education, in the series of reports prepared under the direction of Mr. Michael E. Sadler. In 1897, after the celebration of the completion of the sixtieth year of Her Majesty's reign, it was decided that steps should be taken to prepare a series of reports on colonial education. Letters for specific information were afterwards sent to the Education Departments of Ontario, Quebec, Nova Scotia, New Brunswick, Manitoba, North-West Territories, British Columbia, Prince Edward Island, Newfoundland, New South Wales, Victoria, South Australia, Queensland, Tasmania, Western Australia, New Zealand, Jamaica, British Guiana, Cape Colony, Natal, Malta, and Ceylon. As a result, we have here in these volumes a survey of the systems of education now in force in different parts of the Empire, the most complete information regarding school curricula, teaching, inspection, and administration in relation to primary, secondary, technical, professional, and university education, together with a large number of statistical tables, appendices, etc. For the present we must content ourselves by simply calling attention to the issue of the volumes, and next month we promise our readers a suitable contribution upon the subject-matter contained therein.

PRACTICAL TEACHERS AT GREAT YARMOUTH.

THE THIRTY-SECOND ANNUAL CONFERENCE OF THE N.U.T.

IN brilliantly fine weather, the delegates assembled in large numbers at this delightful east coast resort. From Thursday teachers arrived by every train, and throughout Friday and Saturday many new arrivals might have been seen eagerly making their way through the streets of the town in search of the Reception Room, situated on the Drive or Grand Parade. By Sunday morning the promenade at the front was filled to overflowing with many hundreds of delegates and excursionists, all enjoying the invigorating breeze *au bord de la mer*.

In the afternoon of Sunday a good number attended the special service at the Parish Church of St. Nicholas. It was but meet and right that the delegates should be faithful to the first item on the programme, and those who had the good fortune to be present will not soon forget the beautiful service held. The pulpit was occupied by the Rev. J. G. M'Cormick, corresponding secretary of the Priory Schools in the town, who prefaced his eloquent address on the dignity of the teacher's office and the teacher's opportunities by offering a hearty welcome to the members of the N.U.T. His text was selected from the Gospel of St. Luke, iv. 16: "And he came to Nazareth, where he had been brought up." In referring to our Lord's childhood, he remarked that very little was known, for the all-sufficient reason that there was little to know. He thought, however, that we might assume that He had been taught by some teacher, since it was known that our Lord spoke at least three languages. He liked to imagine an old rabbi as the probable teacher, and, in doing so, supposed that many of his hearers present that afternoon had doubtless experienced the enjoyment of seeing a pupil in after life occupy a position of honour; and he knew full well their joy when they could say, "I taught him." He would not attempt to describe the happy feelings of the rabbi he had mentioned, who, in the later years of our Lord's life, could say, "I taught Him." Since, said the preacher, we could never hope for such a privilege ourselves, we should remember, when discharging the great and precious task imposed upon us as teachers, that our Lord had Himself said, "Inasmuch as ye have done it unto one of the least of these my brethren, ye have done it unto me."



C. S. ORDE, ESQ., MAYOR OF YARMOUTH.

After the singing of our familiar Easter hymns, a collection was made on behalf of the Benevolent and Orphan Funds, and the service concluded with the benediction and a sweet rendering of the late Sir John Stainer's sevenfold Amen.

Monday.

Long before the hour appointed for the opening of Conference, in the magnificent Theatre of the Aquarium, the delegates assembled in full force, and by two o'clock every seat was occupied. It was a vast throng, and those who can look back over the N.U.T. Conferences for the past twenty years will agree that not only was the gathering unprecedentedly large, but that no building more excellently adapted to the requirements of Conference has ever been placed at the Union's disposal. The appearance of the Mayor, with civic following, was the signal for a great outburst of cheering. After this came the N.U.T. leaders, and, as usual, the moment the Union's favourite, "Dr. Mac," was recognised, another good round of hearty cheers was given as he ascended the platform. The Mayor, in a felicitous speech, cordially welcomed the delegates to the ancient town of the east. He had come in full state, in order that all honour might be paid to those who had paid him the much-appreciated compliment of accepting his invitation to Great Yarmouth. In good German and excellent French he welcomed the foreign delegates. He only regretted that his education had been neglected to the extent that he was compelled to plead ignorance of the Welsh and Irish tongues, otherwise he would gladly have greeted the delegates from Wales and Ireland in the mother tongue of their respective countries. After a few words, in support of the Mayor's welcome, by Alderman Worlledge, the Chairman of the Yarmouth School Board, Sir John Colomb, M.P., rose to associate himself in welcoming all to his constituency. The good people of Yarmouth, said the speaker, were described by an old chronicler, several hundreds of years ago, as "courteous and very hospitable;" and in commending the visitors to the town, he felt he might truly say the people of to-day were as courteous and hospitable as of old, and in this respect at least they had not changed. In these times people complained much of the inertness of Government and ineptitude of M.P.'s, excluding, of course (said Sir John Colomb), your own three representatives at St. Stephen's; and he thought the great work done by Conference was of untold value to all M.P.'s. They had to deal with many great questions in the House of Commons, and he thought that members of Parliament might well watch the work of N.U.T. Conferences, and take the Union as their guide in the great work of education.

After a welcome to "this cheerful and breezy corner of England" by H.M.I., Mr. Tillard, the Rev. Hon. F. Pelham, vicar of Yarmouth, addressed the assembly, and, in doing so, offered himself as guide, philosopher, and friend to delegates who might wish to specially visit the historic church. He humorously suggested, or rather warned, those of his hearers, that if they came to the door in the morning they would be supposed to be bringing Easter offerings, for the church depended upon such gifts for support. In concluding his short but exceedingly interesting speech, he pleaded for three additional years of school life, as the only possible remedy for the prevention of all the evils comprehended in the word Hooliganism.

The Rev. C. Nattrass next extended his welcome on behalf of the Free Churches. He agreed with the sentiments of the previous speaker with regard to the extension of time in school life. He said that although he was an Englishman, he no more belonged to Yarmouth than the Yarmouth bloaters themselves. He had spent much time in Scotland, and eulogised the high standard of education north of the Border, and the least he could do was to covet for his own country the high position of Scotland and her people in relation to the work of education.

FOR "DECAYED FISHERMEN."

A YARMOUTH ROW.

SHRIMPERS.

SAFE IN HARBOUR.

In proposing the thanks of Conference to the Mayor, the retiring president, Mr. Marshall Jackman, said that he spoke on behalf of the 44,000 members of the N.U.T. The Mayor had given them charming weather—he congratulated their clerk of the weather—and he thought the Mayor's speech was clever and eloquent. The Conference had in previous years had many excellent speeches of welcome, but they had never before had one in three languages.

Mr. Waddington then rose to second the vote of thanks, and in one of those delightfully humorous and amusing speeches for which he is becoming famous on opening days, he managed to excite continuous roars of laughter for several minutes. Yarmouth was a great town with a great Mayor, for it was the only town in England where, upon the King's accession, the members of the press were sworn in together with Mayor and magistrates. There was wisdom even in that. He had been struck with the honesty of Yarmouth, and he hoped he would be of the same opinion at the end of the week. From what the vicar had said, it appeared that they not only ran education on the voluntary system, but also the State Church. He hoped Yarmouth would be great in Easter offerings to the vicar.

AFTER BREAKFAST.

The resolution was then put and carried amidst great and prolonged enthusiasm.

The enjoyable and successful ceremony of welcome having ended, the retiring president thought Conference should pass a vote of condolence at the death of our beloved Queen Victoria. This was done by the whole of the delegates standing in respectful silence. An address of congratulation to King Edward the Seventh was then moved, the National Anthem was charmingly rendered as a solo by Miss Broome, after which the whole of the assembly joined in and sang with much impressiveness.

THE NEW PRESIDENT.

After the adoption of standing orders, the retiring president vacated the chair, and Mr. James F. Blacker of Brighton was duly installed.

MR. JAMES F. BLACKER'S PRESIDENTIAL ADDRESS.

The opening of the address was an eloquent plea for the neglected child—the Hooligan, the street blackguard—who, as a result of parental neglect, drifts into a life of idleness, vice, or crime. The president deplored the sacrifice of the child by many parents of civilised and enlightened England.

"How can the schools and their purer atmosphere overcome the habitual intimacy which springs from debased and debasing surroundings? The difficulty—a grave one—is to enforce the obligation on the parent, which the violent, the drunken, the dissolute, and the idle are ever seeking to evade. Children are to them a troublesome burden; other people may feed and clothe them—not that they are grateful for that, but their great anxiety is to be relieved from the expense and from the trouble. Another illustration of this is often seen in the police court, where a great hulking father, it may be a brutal one, seeks to divest himself of his duties by getting his small boy sent to an industrial school. Many teachers could give instances of fathers or mothers who have asked them to help in this direction by speaking unfavourably of the boy.

"'Neglect first, cruelty afterwards!' The idle, the vicious, the drunkard will not work if they can exist without it. They are the drones and the pests of the community, but they are worse. It is not necessary to give details of incidents of child cruelty illustrating how the lives of the little ones are in danger from this class of parent. Justice Wills, some time ago, in sentencing a man and his wife to three years' penal servitude for having 'done to death' their little baby boy fifteen months old, said: 'When a man and woman could find money to pour down their own throats, there was no excuse for their leaving their children in the horrible, filthy, foul, and neglected condition which had been deposed to in that case.'

"These are perhaps the strongest words that could be used. 'Taught at the mother's knee!' What a contrast!

"After thirty years of educational effort, why is it that with these parents the standard of duty is so low? Why has a lad or girl no nobler sense of enjoyment than that which comes from riotous conduct in the streets? Thoughtful consideration gives the reply—because they have no homes. Until self-respect leavens the being, and until that is founded upon decent conditions of daily life, progress is improbable. Decency is almost impossible where families are herded together. This is not the place nor time to enter into discussion as to the housing of the poor, except in reference to its close bearing upon education and its aims. The attraction of happiness is universal, although different ideals of happiness exist. The light and warmth, the company and the drink, will draw men naturally if there is no compensating attraction. Given a room for a home, a virago for a wife, crying babies, noisy children, and general discomfort, and how many amongst us would rise superior to circumstances and live a life free from reproach? Is the wife to be blamed or pitied? What are the possibilities of the higher life at £1 a week when the rent has to be paid out of that?

Religious Instruction.

Such children were subject to the influence of the day school, but the Sunday school scarcely touched them. Compelled more or less to attend the former, the benefit of the elements of education was all but lost upon these "regular irregulars." Hence the "inestimable value of religious education—not necessarily dogmatic, according to a formulary, but definite."

"It is not necessary to advocate education in these days, but it is hateful that education should be made the arena for sectarian strife. The spectacle of religion dragged in the mud of School Board electioneering is painful in the extreme, especially to those who know how utterly false and hollow the whole theological cry is. The example set by men who know better must sway the crowd by exciting the bitterest of all animosities. This is one reason why a national system of education with a local authority would be superior to the present School Board system, but there are other reasons. The line of demarcation between the schools where a catechism is taught and those which have simple Bible teaching is a costly one. The child suffers because he is deprived of opportunities in the one case which are provided in the other. The buildings, the general equipment, the staff are all poorer, and indeed everything is inferior, because, on the authority of the late Bishop of London, 'the people of England care nothing for education.'

. . . . . .

"Instead of accentuating points of agreement, too much time and labour are spent in magnifying microscopic differences, especially sectarian.

. . . . . .

"Several alternatives present themselves in the consideration of the solution of this vexed question of religious education, which is the great obstacle in the way of equal financial treatment for all schools.

. . . . . .

The School and the System.

"The hope of adequate voluntary subscriptions to finance the denominational schools has vanished for ever. The valuation of the 'seed bed' of the richest church in the world, as tested by the multitudinous efforts to procure funds by donations, subscriptions, bazaars, concerts, jumble sales, etc., has so far declined that the fair fame and character of these schools are by comparison seriously jeopardised. In addition to this, the incidence of the heaviest pressure has fallen upon the teacher, who realises that he is virtually the largest subscriber to a system which treats him, as a part of the organisation, with scant consideration. The days of plausible sympathy are past; fidelity has been strained almost to the breaking point, and those who have been denominationalists first and teachers afterwards have undergone such treatment that they desire to cast off the bonds which kindly local individual management alone made tolerable. Associations of schools, diocesan religious inspection, organising masters' visitation, all seek to interfere. The first interferes with the finance, which generally means the staff and salaries; the second renders almost farcical what used to be the highest and holiest work of the teacher; whilst the third attempts to frustrate the intentions of the Board of Education, which has, in its latest pronouncements, conceded entire liberty to the managers and teachers to frame such schemes and give such instruction as may be best fitted to the locality and to the probable future of the child. The Board of Education is prepared to trust the teacher; not so the diocesan organisations.

"From these considerations the position arises that it is impossible to continue on the present basis, which has been the preferential treatment with regard to income from national sources of one set of schools, and the preferential treatment of the other set from the rates. Further, in order to secure a national system of education, founded on a general rate or tax, or both, equality of financial treatment for all schools must be accompanied by equality of conditions.

Alternatives to the Present System.

I.

"The first alternative to the present system is the abolition of religious education in the day schools. Would our country maintain its position amongst the nations, would it exist for any length of time, if indeed the schools were 'godless schools'? At the lowest estimate, religion as the foundation of morality is invaluable. In the voyage of life every boat must have a compass immutably pointing in one direction. Without that compass it is lost. Its course may change with the movements of the rudder, at the will of the man at the helm, but the port may be reached even after a devious voyage. The application is sufficiently obvious. Leaving the consideration of the higher religious life, and reasoning from the comparatively mean motive of utilitarianism, the public weal demands that right shall be distinguished from wrong, and the only safe standard on which a sure judgment may be founded is religion. The churches, speaking broadly, do not reach the masses, nor do the Sunday schools draw the most neglected class of children. Therefore it follows that the Bible teaching, on which a national and individual conscience is built, must be given in the day schools.

. . . . . .

II.

"The second alternative seems to be that all religious dogmas should be equally admitted to all schools. The immense varieties of religious belief, estimated at about

three hundred and eighty-two, and the impossibility of finding teachers or rooms sufficient for this purpose, condemn it as impracticable in the day schools, even were it desirable at the public expense. Why should the little ones be relegated to water-tight compartments according to the shibboleths of their parents when even the master-minds of the centuries have been, and still are, unable to grasp the mysteries towards which mankind has been blindly groping? There would arise the danger that professional skill would be subordinated to sectarian belief in choosing the teachers. The predominance of one religious party on a School Board might revolutionise the staff by the compulsory retirement of one set of teachers and the appointment of another. Yet it would be easier to secure the services of teachers on the spot, able to do the work well, than it would be to organise a method of universal denominational teaching. In fact, the Church of England alone has the organisation which could accomplish this, and the result would be constant strife and endless friction.

"The circular of the London School Board might be cited as an instance showing what reception would be accorded to such a proposition as is suggested by this alternative. The danger is not past. Mr. Sharpe, the leader of the Moderates on the London School Board, recently said: 'Our hearts are very full of the religious question, but we have the good sense to keep it quiet, at least for the present.' Sir Charles Elliott told his constituents that 'he was anxious to see the Board School children separated into ecclesiastical groups, and taught the creeds of their parents at the ratepayers' expense.' Mr. Diggle withdrew from the contest because 'he felt that the determination of the Ritualists to reopen the religious question had prevented the Conservative organisations from fighting for the Moderates at the election.' Lord Hugh Cecil stated that 'they will one day throw down the miserable settlement of 1870, and put a better in its place.' At the last Church Congress, Prebendary Gibson said: 'We must not rest till we have secured the repeal of the Cowper-Temple Clause. We will insist on our right to give the teaching of the church in Board Schools.' The Bishop of Carlisle, presiding over the Carlisle Diocesan Education Society, remarked that 'one of the rock-bed principles in dealing with the education of England in the future must be, that the parents themselves must decide as to the religion in which their children should be trained. He would be prepared, as a matter of justice to the parents, to recognise that great principle, whatever the religion of the parents might be. He spoke for himself on this subject, and the view he had expressed was a view he held very strongly.'

"'Taught at the mother's knee!' What is the religion of such parents as those spoken of earlier in this address? Yet *The Church Times* declared: 'We must do our best to get denominational teaching in all Board schools. Slackness in this direction will mean national apostasy from the law of God.'"

After referring to the fact that the parochial clergy showed but little enthusiasm for the everyday routine work of religious instruction, that the tendency—"a proper one"—was to leave the work to the teacher, Mr. Blacker's concluding remarks upon the "second alternative" dealt with the unsatisfactory system of diocesan inspection.

III.

"The third alternative is one which deserves attention. The Bishop of Coventry, at the same Birmingham election, referred to the assertion that it was impossible to give undenominational religious teaching. He challenged this statement, and quoted from a sermon of the late headmaster of King Edward's Grammar School. 'The trained teacher knows that his lessons must be very simple, and adapted to the comprehension of his pupils, and will not dwell on disputed points of theology, but on the great truths that all Christians hold. He will resort much to Bible stories—to the examples of holy men, women, and children; he will teach simple texts that may abide in the memory as long as life lasts; and if he is permitted—this also which we would have conceded to him—to begin the day's work with a simple hymn and prayer, he will often find his burden of responsibility lightened, and spirit refreshed, amid the many difficulties and anxieties of his work.' Then the bishop confessed that he was amazed at the cry of the impossibility of undenominational teaching. Religion was something more than a denominational system; it was a desire to be freed from falsehood which clouded the mind, and the passions that betrayed the will.

. . . . . .

"The far-reaching effects of a fit settlement of the religious question raise such consequential reforms as would revolutionise the educational system of this country. At the same time, there would be a danger in the revival of the New Platonics. There must be plain Biblical instruction, not an attempt to select and reconcile what seems reasonable in the tenets of all, rejecting what is contrary to reason. Such eclectic philosophy aiming at universal concord would produce chaos. The Biblical instruction being the same in all schools, the abolition of the dual system could easily follow, and both Board and Voluntary would vanish in favour of national—primary or elementary. A local authority for all schools would relieve many which have been for years struggling against difficulties, whilst at the same time providing for secondary and even tertiary education according to the needs of the locality.

"Equality of financial treatment, it must be repeated, demands equality of conditions. The evolution of responsible citizens by education is in no sense a local operation, though the first stages may be. The cost of this work should fall upon the whole of the nation. At present—

> 'For ways that are dark,
> And for tricks that are vain,
> School income is very peculiar.'

It actually comes to this: some pay whether they like to or not—the ratepayers; some pay because they may like to—the subscribers—though they are not all voluntary; some do not pay at all, whilst others pay twice. Imagine the army and the navy financed in this fashion! Why should education, any more than these, be dependent upon charity?

. . . . . .

"Substitute a national system with a local authority, and the income derived from increased imperial grant, coupled with decreased but universal local rate, would be sufficient to carry out the whole of the work efficiently. The incidence of the rates does not fall on about a third of the country at all, and these rates are most variable with regard to amount: some are as low as a penny in the pound, others as high as forty pence. The very members of many five-membered School Boards appointed to carry out the maintenance and administration of the schools according to the Education Act and Code are hostile to anything like progress. They owe their election to promises to keep down the rates, and their own pockets being affected, full well do they keep their pledges. Starvation is the outcome, and the teachers fall the easiest prey. Good teachers becoming unobtainable, any must suffice.

The "Article 68" Teacher.

"There are two reasons why an army of unqualified practitioners is employed in teaching. One is poverty of school resources, which may deserve pity and regret when applied to the individual; but ought poverty to plead for the neglect of national duty? The other is parsimony, for which no excuse can be offered. Does the British public realise that this army of so-called teachers, engaged in the difficult and delicate task of dealing with the minds of their little sons and daughters, have had no training for the work they are supposed to do? Some have been pupil teachers, and these form the *élite* of Article 68. The others have not been apprenticed, and may not have received as much instruction as the boys and girls in the upper classes of the school. They are not examined to test what knowledge they possess, but they are cheap. These are the conditions which they must fulfil to become teachers:—

"1. They must be over eighteen years of age.

"2. They must have been vaccinated.

"3. They must satisfy the inspector, who, as a rule, is 'satisfied' without applying any test.

"The poverty or parsimony of the school managers forms a large element in the satisfaction of the inspector. He sees that the qualified teacher must have that help or none. When people glibly talk of the National Union of Teachers as a trade union, the temptation to retort with the above information is too great to be resisted. What trade unionist would work for an hour by the side of such apologies for workmen as these? What profession would permit them to practise?

"Here, again, the remedy is nothing less than a national system of education, naturally followed by the abolition of the unqualified teacher."

For want of space we are here obliged to omit from the president's speech his utterances regarding the pupil teacher, the training colleges, the assistant teacher, and the head teacher.

An Open Inspectorate.

"In other professions there are outlets for merit. Promotion to the highest posts may be slow, but it is certain. Yet teachers, and primary school teachers especially, can contemplate, not with equanimity, but with certainty, the positions which ought to be within their grasp passing constantly into other hands. Surely amongst the thousands at work in the schools there are some who deserve distinction. The old system of nomination is not dead; indeed it is prevalent.

. . . . . .

"The ostracism of existing teachers could be easily withdrawn, and the more so because superannuation has removed the condition often quoted, that age made it impossible for him as a civil servant to secure a competency on retirement. If previous active service in the school was allowed to count, the superannuation of the promoted teacher would be easily accomplished and adjusted.

"No inspector should be appointed who was not a practical teacher, with as complete a knowledge of the art and science of teaching as can be obtained. The primary school teachers claim no monopoly of the inspectorate, but they do claim that they shall not be debarred from it. Whatever university degree must be produced as a condition of future appointment may be demanded from them as from others. At least let it be granted that opportunities shall be provided equally for them as for others; that it is time to relegate nepotism and influence in connection with national education to the pages of history; and that the skill and knowledge engaged in this supremely important work shall be the greatest obtainable.

. . . . . .

A Free Profession.

"Coupled with the demand for an open inspectorate comes, with ever-increasing force, that for a free profession, which can only be fulfilled by the institution of a national system of education. Far back in the ages the church embraced within its bosom the lawyer and the doctor; but when these found that their professional duties were not inseparably allied to ecclesiasticism, gradually they broke away, and to-day they are free. The process of evolution and the building up of professions is slow, and it is exceedingly difficult to trace exactly when the dividing line was instituted. None the less was it sure; and in teaching it is the same.

"From the earliest period, in the Eastern as well as in the Roman Church, the duties of education were entrusted entirely to the monks, up to the end of the eleventh century. By slow but steady steps the universities advanced, ever increasing in dignity and importance, displacing the monasteries as seats of learning, spreading the light of knowledge in widening waves, and creating a spirit of investigation which completely shattered many of the old traditions. The subservience of one profession to another was a principle no longer accepted.

"With regard to a large division of primary teachers, no longer do they submit to clerical domination, no longer are they the servants of another profession, but they too are free. The days of 'my schoolmaster,' 'my schoolmistress,' are for them ever past; and with the advent of a national system it would be so for all. Strangely enough, the desire for freedom has been largely excited by the action of the clergy themselves—not the individual, but the association. It should be emphasised that, to the teacher, fidelity to the church has been the result of personal sympathy and community of ideas; but the Associations of Schools—School Boards in all but money—the imposition of the diocesan inspector, the inquisitorial visits of the so-called organising visitor, have marvellously changed opinion, and converted many who might have been reckoned amongst the strongest supporters of denominational schools. Never again will the church contain within her borders the faithful army of teachers who fought for church schools because they were church schools; who fought for Voluntary school managers because they respected, nay, loved them; who were ready to die in the last ditch because they believed that was their mission. Now, with grander, more comprehensive, more humanitarian, and truer professional view, they set the child, the nation, and the profession before the mere dogmatism which riveted the bonds they loved in the past.

. . . . . .

A United Profession.

"In the legal and medical professions the avenues of entrance are jealously guarded. They have progressed and developed just in proportion to the solidarity of their aims, and now they are the closest corporations—really professional unions. They retain the power of expulsion for the recalcitrant or criminal member. The other learned profession—the clerical—is similarly a close corporation, every active member of which must be licensed before he can officiate in any diocese.

"The future organisation of teachers must be in the direction of combination under the auspices of some general educational council, empowered to examine and to grant diplomas. The constitution of this council would demand the most careful attention. The first step in professional unity is the formation of a register; and the fairest and wisest course seems to be to open the register to all grades of teachers—at least at first. A limiting period of three or four years would regulate this form of admission, but afterwards none should be registered without due qualification. Professional jealousy may attempt to debar the certificated teacher from admission to the register; those who have spent many years in learning how to teach, and more in active service as teachers, may be refused professional recognition because there happens to be a socially higher class of men and women acting as teachers in secondary or public schools whose professional training for the most part has been *nil*, or of the most desultory and inefficient type. But this cannot be allowed. The register must be comprehensive, and not invidious. And if so, instead of antagonism, with the consequent irritation and loss of power, co-operation of all orders of teachers would lead to unity of the profession. The learned professors at the universities, the heads of the great public schools, and others distinguished in the pedagogic world would lose nothing by stretching out the right hand of fellowship to those who are working in humbler spheres of influence.

"The organised thousands of the National Union of Teachers have aspirations toward that high intellectual plane which has come to be embodied in one word—'culture.' Without substituting for true culture its hypocritical counterfeit, 'affectation,' they are conscious of progress towards it. They are confident with the knowledge of many victories won—victories which leave no regrets, because they have conquered ignorance and tyranny. They increasingly realise that there can be no finality in connection with education; and in heartily recognising the labours of those who have entered into their rest, they hold a fixed and immovable determination to adopt and maintain a progressive policy, to which the past forms a grand incentive.

"These desires, intentions, and designs will secure increased success in the future, according to the reality and concentrated strength of the work to be unflinchingly carried on by a united profession. Each teacher must demonstrate love for the child, which must be both real and intense, whole-hearted in its devotion, because childhood unmasks shams and shuns them. The keenest and most lively interest must be allied to prudence, moderation, discrimination, and wisdom, so as to win ever increasingly the confidence of the parents, the electors, and the Parliament. The schools exist for the children; and the teachers are as anxious to recognise this as they are that the Government should understand that it exists for the people. There should be no room for antagonism, or even party politics, in connection with a matter of such supreme importance as national education.

"By the educator there must be a subordination of selfishness, in order to magnify and exalt the great work which forms life's occupation. The true teacher

> 'Is but as the hind
> To whom a space of land is given to plough,
> Who may not wander from the allotted field
> Before his work be done; but, being done,
> Let visions of the night or of the day
> Come as they will; and many a time they come.'

These visions often repeated become ideals and the mark

for aims. Teachers must aim high, and ever strain onwards to fulfil the immutable intention of the Creator in the elevation of souls and bodies, the exciting of mind and heart to contemplation, wisdom, and adoration of the Highest."

THE DEPUTATIONS.

One of the most interesting and pleasing features of the opening day is the reception of the visiting deputations. This year the representatives came from Scotland, Ireland, Belgium, and Holland. First in order, the president introduced Mr. Alexander Menzies from Kirriemuir, the President of the Educational Institute of Scotland. Mr. Menzies said he came to bring greetings and a message of friendship and good will, and that it was his earnest wish that the good understanding between the two unions should be strengthened and perpetuated. In Scotland, he said, their membership was small, when compared with the N.U.T.; and, in referring to parliamentary representation, he quaintly observed that Scottish constituencies were more suspicious and much less manageable than English constituencies. Finally, he referred to the Cockerton judgment, and said that such a decision would never be given in a Scotch court of law.

Next in order were the Irish delegates, but as time pressed, Conference was deprived of their customary treat of sparkling wit by the orators from the Emerald Isle.

M. Blondiau and M. Rossignol came as representatives of the Fédération Générale des Instituteurs Belges. The latter addressed the Conference in English with much success. According to custom, we give the speech exactly as read:—

"Mr. President, Ladies, and Gentlemen,—I think you will permit me to read the few words I wish to address to you.

"Last year my colleague and I received from your thirty-first yearly Conference, at York, the most charming impression of the hearty reception you have given to us. Your speeches, your debates, your resolutions have profited us very much indeed. You have affirmed that the problem of education is intimately connected with the question of the just and equitable security given to the schoolmaster; and it is in this question of the independence that they ought to be surrounded with, that you have at the same time resolved the problem that is preoccupying at this moment the Belgian schoolmaster.

"It should be useful to you to have an account of the security, the situation of your colleagues of Belgium, and also what are the remedies they propose to bring on the situation. I gave to your honourable president a number of books treating, with regard to the Belgian schoolmaster, the question of security that preoccupied you last year. I wish that the first inquiries should be the beginning of an exchange of views, of communications, and of inquiries between the different federations of teachers. Two years ago, in our Belgian corporation, the necessity of stronger bonds between the different teachers' unions has been proclaimed. Our general president, Mr. Van den Dungen, in order to realise this wish, wrote to the English, Dutch, and French federations to ask for the exchange of newspapers. We hope that this proposition will extend itself to the other nations.

"I don't want to make a long speech to justify what I have just said to you, ladies and gentlemen. It seems sufficient to me to indicate that the problem of education is neither English, French, Dutch, nor Belgian; it is scientific and moral, and, of course, international. I take the permission of making the following proposition:—The English and Belgian federations should exchange newspapers and opinions.

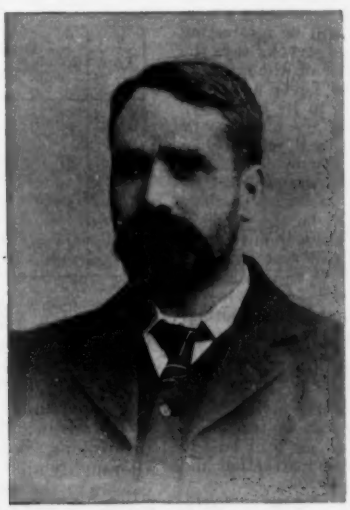
"It seems a last duty to me, ladies and gentlemen, to wish that your work will be as profitable as possible, and that during this federal year the wishes that you form for the resolving of the question of a just and reasonable security for the teachers should be realised. I express this wish very heartily."

The president next introduced an old friend to Conference, M. Van Dam. His speech, as might be expected, caused much amusement and laughter, and his many asides were screamingly funny. In excellently pronounced English M. Van Dam spoke as follows:—

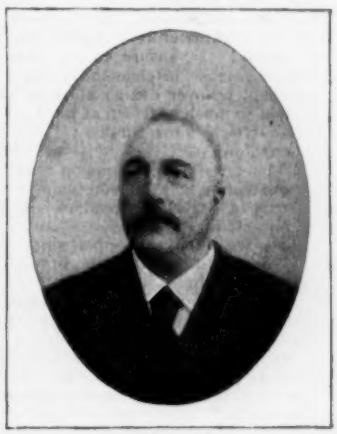
"Mr. President, Ladies, and Gentlemen,—What is the reason of my again being kindly invited by your Executive to attend your Conference? Would you like to know it? It is not because of myself having rumoured the world by some suddenly invented doctrine in the pedagogical or educational line; for, I've not to tell you, a teacher's life is too monotonous, too uniform, too much on a level for that. A teacher's life, especially where it is the fruit of a set inclination and positive choice, is flowing on silently, without causing surprising turns and interesting adventures. A teacher's life has its storms and struggles, its ebb and flood, its joy and grief; but those movements are usually restricted to his own mind and his own circle, without being able, be it only for a moment, to wrinkle the surface of human life. No, ladies and gentlemen, that's not it. But it is the great desire of my heart to renew the acquaintance with your hospitable country, to see again the old familiar faces I have had the pleasure of meeting first in my Lowlands, well-nigh five years ago, where I made the acquaintance of our dear Addiscott, who was then still fighting his fight nobly and well, and of Mr. Shadrach Hicks; it is the acquaintance I afterwards made of Messrs. Waddington, Jackman, T. P. Sykes, Ellery, and many more,—which acquaintance was largely extended on different opportunities either here or in Holland.

"It is true I can make one exception. Not later than yesterday I was shown five miles off by Mr. Croft to find an address which is not five minutes distant on the Marine Parade. A friend of mine, a gentleman among your number, suggested the supposition that even that wrong address was given in behalf of my health—namely, to have the walk. If that is the truth, I acquiesce, and look upon it as an earnest of pleasing me somehow and anyhow. But, on the other hand, it is greatly indemnified to me by the care the friend took of me from the moment I

ALEX. MENZIES, F.E.I.S., J.P.,
President E.I.S.



MR. BLACKWOOD,
Scotland.



M. VAN DAM,
Holland.

got out of train. It is the friendship we felt for each other from the first moments we met, and the compliments we had to make in connection with your organisation and ours, *that* gave us a feeling of brotherhood. It is the zeal and energy, which I observed every time I was here, with which you organised your Union; it is the men and women to whom the English nation has confided the education and instruction of the English young people, and who do that with a perseverance that bespeaks great minds.

"Your Executive feel that there should be nothing but the best and kindliest feelings between the teachers of different nations. That is exactly my opinion, and in the spirit in which the hearty invitation was given I have accepted it. The different members of your Union have, as ours, different political views, but that is no hindrance to them to agree and work cordially together in helping for true educational reform. That spirit which pervades your Union I admire very much. Without doubt education makes great progress in your country. In many respects you are our superiors in the educational line. In other respects we seek the same measures in order to promote our systems.

"In the March number of the *Teachers' Review*—which we read in Holland, as well as the *Schoolmaster* and others of your valuable sendings—there is one article which runs as follows: 'The making of education compulsory in Holland will be watched with interest by English teachers. Without the strong arm of the law, the Dutch people had a high regard for education; but now that compulsion is applied, it will be interesting to see how schools are affected. I was always struck,' says the article, 'with the position of the Dutch teacher on the question of corporal punishment, for instance. They never asked for power to administer it, nor did they believe in its necessity.' Quite right! I venture to say that during my forty years' career as teacher in elementary, high-grade, and middle-class instruction, I never did so much as take a boy by his throat, or seldom so much as frown at him.

"The article runs further: 'Head and assistant teachers were unanimous on the question. What will be the effect of compulsion? Of yore expulsion was an effective punishment, but there can be no expulsion under a compulsory system. Perhaps some of our Dutch readers will give us their experiences for publication.'

"Here we have the opportunity of helping one another. Messrs. Jackman and Waddington are already informed of my presenting a helping hand, and I'll do that very willingly; for not only a friendly feeling should exist between the teachers of the different nations, but the readiness to help. It is with that sentiment in mind that I responded to the hearty invitation of your Executive. May that brotherly feeling long continue, and increase as the years go on. May this Conference lead largely to the promotion of our mutual purpose—good instruction and good teachers."

MR. CROFT ELECTED VICE-PRESIDENT.

The president then declared the result of the election for vice-president. The votes were:—

Mr. Allen Croft	15,428
Mr. Harry Coward	12,287
Mr. Muscott	2,471

In the evening there was a largely-attended meeting of the National Federation of Rural Teachers, and later the Mayoral reception at the Town Hall. Nearly two thousand invitations were issued by the Mayor, and the evening, amid the flowers and foliage of the Mayor's drawing-room, was a thoroughly pleasant and enjoyable one. An excellent programme of music was executed by the band of the Norfolk Artillery.

Tuesday Morning.

Punctually at ten o'clock the president rang his bell, and to a full assembly of delegates Mr. Blacker repeated the announcement of the previous evening as to the election of his successor. This was followed by a lengthy declaration of the result of the polling for the Executive in the various electoral districts. An attempt was made to cheer the names of the most popular men and women returned, but Mr. Blacker suggested that it would save time if the Conference gave one cheer "for the lot," at the end of his declaration. Conference promptly took the hint, listened intently to the returns, and then there was a great salvo of cheering. All the old members of the Executive retained their seats, with the exception of Messrs. Hindmarsh and Jenkins. The narrowest of margins accounted for their non-success—Mr. Hindmarsh being but seventeen votes, and Mr. Jenkins five votes, below the last of their fortunate opponents. The loss of Mr. Jenkins is particularly to be deplored, for he was on occasion one of the most brilliant and rousing speakers on the Executive, as well as a very wise and far-seeing educationist. The following table may possibly be interesting to those who love statistics:—

N.U.T. Elections (Executive).

Year.	Number of Candidates.	Average Number per District.	Districts with no Contests.	Old Members Unseated.
1898	86	7·2	...	3
1899	58	4·9	2	4
1900	60	5·0	1	4
1901	52	4·3	2	2

V.-P. Election.

Year.	N.U.T. Membership.	Voting Papers Returned.	Number of Candidates.	Winner.	Winner's Poll.	Winner's Percentage of Votes.
1898	38,687	29,179	3	Clancy	15,506	53·1
1899	40,485	28,884	5	Jackman	7,679	26·6
1900	42,005	28,665	4	Blacker	13,711	47·8
1901	43,614	30,186	3	Croft	15,428	51·1

In response to Mr. Blacker's call, the new vice-president, Mr. Allen Croft (who was most cordially and enthusiastically received), returned thanks for the great honour conferred upon him. After a brief reference to the friendly character of the recent contest, Mr. Croft promised that, so far as ability and opportunity would allow, his constant endeavour would be to advance the prosperity and dignity of the noblest of professions, and to emulate the splendid example of the thoroughly able and devoted men who had been his predecessors in the office. Conference cheered once again, having evidently made up its mind that the new vice-president is to be a big success. The defeated candidates, Messrs. Coward and Muscott, in turn congratulated the new vice-president, and themselves received such an amount of encouraging and sympathetic applause that they will doubtless renew the campaign with increased vigour. Next Messrs. Bateman and Francombe, on behalf of the Lord Mayor of Bristol, offered a hearty invitation to the Union to hold its 1902 Conference at Bristol. It is almost needless to say that the acceptance was unanimous and enthusiastic. After all this domestic business, Conference settled down to a consideration of perhaps the most important resolution of the past five years. This dealt with the vital matter of the constitution of the new education authority, and was in the capable hands of Messrs. Waddington and Wild. Mr. Waddington is, as every one knows, a great debater, and realising the perhaps unparalleled importance of the occasion, and the necessity for a unanimous vote, made one of the finest speeches of the week. An ovation greeted Mr. Wild, who seconded the resolution in forcible style. The hour devoted to the discussion was well spent, and after many excellent points had been made by Messrs. H. J. Wood, Bunting, Gray, M.P., and Pitt, the Executive's motion was agreed to, with but one dissentient. Dr. Macnamara, M.P., and Mr. Rankilor had the subject of "The Educational System and Financial Aid to Schools" in their charge, and had no difficulty in proving to Conference the wisdom of the Executive's recommendations. The old "Discipline in Schools" resolution went through unanimously, and when the session closed "Examination of Scholars" was on the *tapis*.

Tuesday Afternoon.

The first of the "Private Sessions" has of recent years, unfortunately, furnished incidents of a painful and unpleasant character far too frequently; but the inevitable reaction has followed, and Tuesday afternoon showed Conference once again clothed and in its right mind. That fruitful source of dissension, the report of the examiners of accounts, provoked a slight ripple of uneasiness. Mr. Peaker's admirably lucid statement of the actual facts, however, soon restored the equanimity of the delegates, and it is difficult to see why ambiguous and misleading paragraphs should be issued at all. The mode of electing the Executive filled up the afternoon's programme, and was noteworthy for the attempt to exclude from the N.U.T. parliament all persons except those actually engaged in school. The new vice-president was able to show the extreme desirability of having men in an independent position at Russell Square, and instanced the valuable services of Messrs. Peaker and Waddington in many capacities. The vote of Conference decided, by an overwhelming majority, to leave to the localities the right to select whatever members they pleased. During this debate, Mr. Tom John summed up what was perhaps in the minds of many people thus: "If you want to see distrust in a crystallised form, come to a Private Session."

THE CONFERENCE DINNER.

The Conference dinner is held so that the leading citizens of the Conference town and the teachers who have organised the Conference may receive the hospitality of the National Union of Teachers. This year, except that there were too many speeches, the gathering was completely successful. To begin with, the hall is particularly handsome, brilliantly lighted, and tastefully furnished. During the meal, too, good music was performed by a band in which stringed instruments predominated; and the vocal music between the speeches was of a much higher order than usual. The dinner was excellent. The president of the Union, Mr. Blacker, was in the chair; the Mayor was present, and so plentiful were members of the House of Commons that the toast of the Houses of Parliament was acknowledged by five speakers—Colonel Lucas, Sir John Colomb, K.C.M.G., J. H. Yoxall, M.A., T. J. Macnamara, LL.D., and Ernest Gray, M.A. Mr. Yoxall said he sees a better attitude towards education in the House of Commons, and he thinks the outlook is hopeful. Dr. Macnamara remarked that unless there is something done, England will lose, by lack of education, the markets we have won by the sword. Amongst other speeches were those of Mr. T. B. Ellery and the Mayor of Yarmouth. Mr. E. W. Worlledge, Chairman of the School Board, responded for the toast of "Education," which Mr. Allen Croft had proposed; and Alderman F. Arnold submitted the "N.U.T.," a toast that was acknowledged by the president. The Union veteran, Mr. Robert Wild, B.A., proposed the health of "The Visitors," and this included the deputations from Scotland and Ireland, and from foreign lands. Mr. Blackwood spoke for Scotland, and a most humorous speech came from M. Van Dam, the Dutch representative, who explained that he had "picked up some words which I happily pronounce in the English way." He referred to a remark from Mr. Blackwood about the popular idea that Scottish people cannot understand a joke, or, as M. Van Dam said, that "there is no wittiness to be found in him," and asked, "Where is it to be found, then?" Why, he had seen a book of Scottish witticisms, and the greater part he had learned by heart. Even when a child he heard of Yarmouth bloaters from his mother, who was very fond of them; and as soon as he emerged from the station he became conscious of the herrings. He had always been curious to know how a Yarmouth bloater would look in Yarmouth, and the creature had not disappointed him. All he expected had been fully realised.

Wednesday Morning.

By common consent, the first place on Wednesday morning was given to alterations in the Code; but as these are, this year, of comparative unimportance, Messrs. Wild and Croft, as chairman and vice-chairman of the Education Committee, had less than usual of a field-day. "Higher Elementary Schools" was naturally the *pièce de résistance* of the morning, and Mr. George Sharples (the chairman of the Technical and Secondary and Evening Continuation Schools Committee of the Executive) introduced a resolution containing a variety of valuable suggestions for the consideration of His Majesty's Government. The earnestness and sincerity with which Mr. Sharples laid the position before Conference secured for him an extension of time, which he made admirable use of. His seconder was Mr. T. H. Jones, one of nature's gentlemen, whose devoted labours on behalf of his fellow-teachers, in his capacity of chairman of the Tenure Committee, will never be known. Closely connected with the subject of higher elementary schools comes, of course, the "Cockerton" judgment, and here Dr. Macnamara was to the fore in his own irresistible style. "Attendance at School," though extremely important, was listened to impatiently, and speedily dealt with; and the last subject discussed *coram publico* was "Salaries of Certificated Class Teachers." The closing scenes of the public session are now concerned with the votes of thanks, and the presentation of an illuminated address to the retiring president. Mr. Blacker was singularly felicitous in proposing the thanks of Conference to the Mayor and Corporation of Great Yarmouth, and the local teachers for the completeness and excellence of the arrangements for the convenience and comfort of the delegates. The Conference chairman and secretary, needless to say, were enthusiastically greeted when acknowledging the votes of thanks; whilst Mr. Jackman's speech, after his acceptance of the address, contained many good things.

Wednesday Afternoon.

The first business was the unanimous passing of the resolution subjoined:—

> "That, in grateful recognition of the lifelong services rendered to the cause of education by Mr. Robert Wild, B.A., twice president of the National Union of Teachers, this Conference decides that he be presented with a suitable address, accompanied by some tangible memento of his invaluable labours."

The N.U.T. can ill afford to lose the services of men like Mr. Wild, whilst the wrench to himself must be most painful. Associated as he has been with the Union and its Executive from the very start, Mr. Wild has achieved a unique position in the hearts and affections of the members of the Union, whilst his record—"twice president"—will probably never be equalled.

Conference next resumed the discussion of the mode of electing the Executive, and here a determined attempt was made to upset the present constitution and introduce a system of single-member constituencies. The old arguments were in the main "trotted out," and although the advocates of revolution made a big effort, they were doomed to failure. The show of hands was overwhelmingly against them, but a division was claimed, with the following result:—

Against single-membered constituencies.....			23,536
For	"	"	 11,217
		Majority.....	12,319

Probably this decisive vote will settle this matter for a year or two, although "one never knows." An important alteration in the rules now provides that in electoral districts, where the membership exceeds 4,000, an additional member of the Executive shall be allotted. Yorkshire and Lancashire will come under this arrangement forthwith. Conference closed by acclaiming, in the most enthusiastic and hearty manner, its chairman, Mr. J. F. Blacker, who had won golden opinions from start to finish.

Thursday.

A brief note must perforce suffice for Thursday's proceedings. The annual meeting of the Benevolent and Orphan Funds went off satisfactorily, although one year's experience of electoral districts has proved more than the members could stand. The presentation of purses was the delightful and interesting function it invariably is. Sweet music, short and pithy speeches, and the graceful reception of the purses by the Countess of Leicester were the features of a well-organised meeting. The total amount contributed was

£9,439, 17s. The Birmingham Trophy was won by the Halifax Association with the total of £333, 6s. 9d. The amount received from York was part of the last Conference effort, and did not qualify for the shield, so that the Halifax Association had collected the largest amount. The West

"INASMUCH AS—"
(*From the large engraving. By permission of Henry Graves and Co., Ltd., 6 Pall Mall, London.*)

York Shield, for the highest average per member, was won by the Newport Pagnell Association, the amount being £94, 3s. 3d., and the average £2, 1s. 10d. By the kind permission of Messrs. Graves and Co., we are able to insert the beautiful illustration which appeared on the programme issued for the afternoon's ceremony.

The Conference Ball in the sumptuously decorated Assembly Rooms was a brilliant success. Every arrangement for the comfort and pleasure of the gathering was carefully planned, and all had a thoroughly enjoyable evening.

Friday.

The last item in the programme for the week was the excursion to Norwich, the Conference town of 1885. Special arrangements had been made for about twelve hundred delegates, and out of these some seven hundred visited the extensive works of Messrs. J. and J. Colman at Carrow. A sumptuous and substantial luncheon was prepared for the entire party, and whilst the delegates freely partook of the good things provided for them, the Carrow band discoursed sweet music on the lawns close by. After luncheon the president, Mr. Blacker, warmly thanked all concerned for the princely entertainment they had received, and for the facilities which had been offered for the inspection of the works.

In the afternoon the party visited the Cathedral, there to hear an appropriate address by the Rev. F. C. Davies, who acted in place of the dean. From four till seven o'clock a reception was held by the Mayor and Sheriff of Norwich in a choicely adorned hall. After further thanks from the president, who remarked that their visit to Norwich had been a red-letter day in the history of the Union's conferences, the party once more returned to Yarmouth, there to prepare for home. This enjoyable day was a fitting conclusion to one of the most successful conferences ever held by the N.U.T.

THE PUBLISHERS' EXHIBITION.

It is difficult within the limits of our space devoted to Conference matter to give anything like an adequate account of this Exhibition. All the leading publishers of educational works were represented, and in most instances fine exhibits were erected. The halls were rather small, and, had a larger place been available, there would have been a greater number of more striking exhibits. Being attached to the Conference Hall, the Exhibition in consequence was thoroughly well attended throughout the week, and a great deal of genuine interest was taken in the many specialities exposed to view. Wall sheets, maps, books, etc., were all cleverly arranged, so as to enable visitors to examine the specimens with the least possible trouble. In fact, after many years' experience, the publishers' representatives are now so expert in the arrangement of these show-tables, that among them they can in twenty-four hours fix up an exhibition of school material which, in quantity and quality, will favourably compare with some of the Continental exhibitions which have taken as many years to establish.

In view of the fact that most of the educational publications soon after their issue are noticed in our review columns month by month, we must content ourselves by giving simply a few jottings of things seen at the Exhibition.

One of the most striking exhibits was that of Messrs. E. J. Arnold and Son, the well-known school outfitters and publishers of Leeds. Here were displayed a long series of original copyright engravings specially selected for school and home use—for example, English cathedrals, well-known engravings (scriptural and secular subjects), portraits of kings, queens, scientists, inventors, authors, etc., famous masters, relief maps, science charts, freearm drawing series, and numerous other specialities for the kindergarten, the classroom, and the study. To aid still further the growing taste for beautifying the school, Messrs. Arnold and Son have recently manufactured a number of charming busts and statuettes, entitled "Gems from the Antique," "Famous Men." Other firms, such as Messrs. Brown and Son of Hull, and the Educational Supply Association, showed a large number of wall sheets and pictorial illustrations. The last mentioned firm has recently projected a Higher School Series of Text-Books for Junior Examinations, edited by the Rev. C. S. Dawe of St. Mark's College, Chelsea. Several specimens of this promising series were on view.

Messrs. Chapman and Hall showed a new series of Plaster Casts for the Use of Art Students, Designers, etc. These casts are produced on the premises by expert Italian workmen, under the immediate supervision of well-known art masters, the gelatine mould method being employed wherever possible, as the models so secured are remarkable for their accuracy, finish, and beauty.

Messrs. W. and R. Chambers of Edinburgh had also an exceptionally good exhibit. In addition to the new series of Twentieth Century Coloured Readers, Continental Geographical Readers (Colour), School Histories of the Victorian Era, etc., special prominence was given to the twentieth century issue of the firm's well-known and deservedly popular *Encyclopædia*. This truly magnificent work is now being offered in ten volumes, at a remarkably low price, under special arrangements with the publishers, by *The London Daily Express*. Close to this exhibit was that of Messrs. J. Curwen and Sons, the famous publishing house of tonic sol-fa publications. Besides Curwen's *Choruses for Equal Voices*—a publication, we understand, that is now more largely used in schools than any similar series—we saw various books for the infant school and kindergarten, such as *Figure Drawing for Children*, *Kindergarten Gift Plays*, *Battledore and Shuttlecock*, *Huddersfield and Yorkshire Kindergarten Games*, *Song Stories for the Kindergarten*, *The Piccaninnies' Holiday*, and *Songs for Little Children*.

Messrs. Blackie and Son, as usual, had a large and beautiful exhibit of their well-known Educational Series. Conspicuously arranged were the Vere Forster Art Series of Colour and Drawing Books. Other series, such as the New Century Geographical Readers, Continental Geographical Readers, Illustrated Latin Texts, and New French Primers and Reading Books were also prominent.

Most noticeable at Messrs. Macmillan's stall were the New Brushwork Copy Books, Object Lessons for Rural Schools, Official Writing Charts, Copyright Standard Works, and Text-Books in all subjects. Messrs. Moffatt and Paige showed Maps, Natural History Designs, and a variety of Charts, etc., together with their English Literature Series, edited by T. Page. Messrs. G. Philip and Son had a good show of Relievo Test Maps, Object Lesson Pictures, Map-Building Sheets, and their excellent Pictorial Map of the World.

Messrs. George Gill and Son made a striking exhibit of their splendid series of Cartographic Wall Maps. It is no exaggeration to say that the excellence of these large, clear, and beautifully-coloured maps commands attention. They were much admired during the week. Among the firm's other publications we noticed the New Sphere Atlas and the Normal Series of Copy Books. The silver cup in connection with Messrs. Gill's Normal Writing Competition was also on view, and attracted much attention.

Sir Isaac Pitman and Sons, who are now showing much enterprise in the issuing of educational works, had a remarkably good collection of new publications to show. The King Edward Historical Readers, New Era Geographical Readers, and Modern Language Manuals were well to the fore. Messrs. W. and A. K. Johnston of Edinburgh showed a large variety of finely-executed Wall Maps, Atlases, Charts, Diagrams, etc. New maps of South Africa, and the new

MESSRS. E. J. ARNOLD AND SON'S EXHIBIT.

edition of the Howard Vincent Map of the British Empire, were among the firm's special features this year.

Messrs. Charles and Dible had a large show of kindergarten books and materials, and, having the advantage of a well-lighted corner of the Exhibition, were able to attract much attention to their many and varied productions issued for the infant school teacher and scholar.

The Religious Tract Society showed Scripture Cartoon Series, and a large collection of school prizes and useful handbooks.

Messrs. George Bell and Sons had a good exhibit of text-books, including their new series of Illustrated Classics in Colours. The University Tutorial Press, whose manuals are so well known to university and other students, had a large and neatly-arranged selection of their works. Messrs. Bacon and Co. showed their new Drawing Series, Excelsior Maps, Picture Alphabet, etc. Other publishers—such as Messrs. Jarrold and Sons, National Society, Blackwood and Sons, G. Newnes, Messrs. Cassell and Co., Ed. Arnold, Longmans and Co.—also exhibited. There was a good deal of school furniture shown by various firms; but we have little space to spare, and must forego the pleasure of noticing these in detail. One speciality, however, we must find room for—namely, Bridge's new movable partition for schools (the Educational Furnishing Company, Ltd., Stourbridge), an extremely simple and effective piece of mechanism, easily manipulated, and adapted to any size or shape of room. Bridge's patent school desks—the "Kidderminster," "Incomparable," and "Invicta"—are three desks of the most modern type. The "Kidderminster" is admirably adapted for freearm drawing, and the "Incomparable" is capable of being adjusted in a variety of useful positions for writing, drawing, drill, etc. The "Invicta" is an infants' desk, somewhat similar to the "Incomparable" in construction. A child's fingers cannot possibly get pinched in the movement of the desk-top or seat. General school furniture of every type is manufactured by this firm.

We must not omit to mention the exhibit of an old friend at Conference, Mrs. Hibbert of Shrewsbury. Mrs. Hibbert has, to our knowledge, with very few exceptions, attended the Conference exhibitions of the past quarter of a century. Her infant school publications are so well known that it would seem superfluous to draw attention to them in detail now. In addition to the Knitting Frames, Red, Yellow, and Blue Triangular Ball Frames, Action Song and Recitation Books, a new Word-Building, Spelling, and Writing Frame (with blackboard attached) was specially exhibited. This frame is simple, effective, legible, and durable, and by its aid the work is made easier for the teacher and the child.

It would be affectation on our part to pass over the exhibit of the proprietors of this journal, Messrs. Thomas Nelson and Sons. In their well-arranged table and wall-space they exhibited their new series of Literary Reading Books—the Royal Princess Readers, with coloured illustrations, for girls' and mixed schools; Nelson's New Drawing Course, by J. Vaughan, Art Master, School Board for London; New Illustrated Composition Series, New Code Metric Arithmetic for the Upper Standards, the Royal Osborne Geography Readers, Royal Windsor History Readers, and an entirely new series of Supplementary Readers for both Infants and the Standards. Other publications were the Royal Portfolio Series of Object Lessons in Natural History and Plant Life; Wall Atlas Series of Test Maps, Science Wall Sheets, Prize Books, and the various bindings of the New Century Pocket Library of Standard Novels, printed in large type on the Royal India Paper.

THE PROVIDENT SOCIETY.

The twenty-fourth annual meeting of this society was held in the Aquarium. So protracted had been the proceedings of Conference in the afternoon, that but a short time elapsed between the closing of one meeting and the beginning of the next. Mr. Blackburn, the chairman of the society, moved the adoption of the annual report in a smart speech, which caused one to hope the meeting was to be short. But the hope was a delusive one. Several members took exception to the action of the Board of Management in deciding to increase Mr. Golding's salary without first obtaining the mandate of the annual meeting. All the speakers made it perfectly evident that the objection was not taken on the ground of the undesirability of doing what the Board had done—every speaker was loud in praise of Mr. Golding's splendid services—but because the action of the Board was irregular. After several members had satisfied themselves by expressing their dissatisfaction in various ways, the motion to delete this part of the report was withdrawn, the action of the Board was condoned, and the report carried unanimously. The re-entry of Mr. Golding into the room was signalised by hearty applause. We congratulate the Board and the annual meeting on this recognition of the services of a secretary whose thoughts are for the society first and last, and all the time.

The presentation of the balance-sheet gave rise to the usual sheaf of questions, which were ably dealt with by the treasurer and chairman. Two amendments to the rules were down for discussion. The first, a private motion, which proposed to alter Rule 75, was defeated by the previous question. The second, which Mr. Tiley moved for the Board of Management, and which set up a new Table VIII., and a general motion proposed by the Board, which concerns the admission of existing teachers, were carried, while several motions standing in the names of private members were lost.

The most interesting part of the proceedings has yet to be related. Mr. C. James, the assistant secretary of the N.U.T., has done excellent service to the society since its establishment in 1878. The increasing work of the N.U.T. has at last compelled him to resign his position on the Board, and his colleagues decided to mark their sense of the value of his

THE CONFERENCE DELEGATES.

(From a photograph by kind permission of Mr. Frank A. Sayers, King Street, Great Yarmouth. *See also page 565.**)*

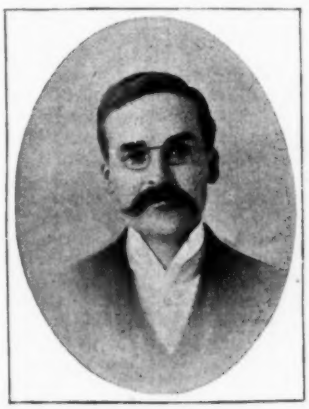
untiring work for the society by presenting him with an illuminated address, in which they say,—

> "His indefatigable labours on behalf of the society in the early days of its career will ever be gratefully remembered."

The members generally expressed regret that the whole of the members had not had the pleasure of subscribing to the testimonial. Mr. James, in rising to return thanks, was received with enthusiasm. A vote of thanks to the chairman closed a most successful meeting.

THE CONFERENCE SOUVENIR.

Messrs. Jarrold and Sons deserve the hearty congratulations of all delegates for the truly magnificent volume issued by them as the authorised official guide to the Yarmouth Conference. Year by year, as the Souvenir increases in size, it improves in quality; and the volume before us is an excellent example of typography, both as regards letterpress as well as cut-printing. The editorial work has been ably done by Mr. H. G. Day, the Conference secretary, who, as



H. G. DAY,
Conference Secretary.

our readers are aware, specially contributed the article on the Conference town which appeared in our last issue. The work has in every respect proved an interesting and serviceable companion to the delegate, and we are quite sure that it will be carefully treasured by all who are the fortunate possessors of a copy. The illustrations alone form a veritable portfolio of art treasures in relation to the historic side of the county, and the letterpress which they illustrate will serve to make the volume a useful work of reference.

PHOTOGRAPHIC GROUP OF DELEGATES.

By the kind permission of Mr. Frank A. Sayers, photographer, King Street, Great Yarmouth, we are enabled to publish a reproduction of the excellent group taken in front of the Aquarium during Easter week. Mr. Sayers has issued this photograph in two different styles—namely, as a silver print at 2s., and as a platinotype at 2s. 6d. The actual size of the picture is 12 in. by 10 in., and with mount 18 in. by 15 in. As a large supply will be printed in order to meet the needs of delegates and others, we are glad to avail ourselves of this opportunity to draw the attention of our readers to this remarkably cheap production.

THE CONFERENCE DELEGATES.
(From a photograph by kind permission of Mr. Frank A. Sayers, King Street, Great Yarmouth. *See also page 568.)*

SIMPLIFIED FRENCH SYNTAX.

THE FRENCH ACADEMY BLOCKS THE WAY.

IN our November number we gave *in extenso* the decree of M. Georges Leygues, which made sweeping simplifications in the useless subtleties of French syntax. This decree roused the ire of the French literary junta, the Academy, and was in consequence withdrawn for reconsideration by the Conseil Supérieur and the Academy itself. We have before us a communication from the Minister of French Education—the amended form of the decree, as well as an English version thereof (which may be had from Messrs. Hachette of King Street, Charing Cross, for a penny)—and we regret to have to inform our readers that much of the promised simplification has vanished. In particular is it matter for regret that we are denied the boon of an invariable past participle, even after reflexive verbs.

Comparing the new decree with that issued in August last, it is to be noted that Article 2, which there states that nothing contrary to the spirit of the simplifications set out in the paragraphs of the decree, should be taught as "rules," has been withdrawn, so that the antiquated subtleties may still linger on as rules at the option of the teachers.

Vanished also are the licenses with respect to *témoin*, *prendre à témoin*, *œuvre*, and *période*.

Aigle is still to have two genders, remaining feminine when used to designate a military standard, as in *les aigles romaines*.

Compound Nouns.—The ten paragraphs simplifying use and wont under this head have gone by the board, and there remains but the abolition of the hyphen in such expressions as *chef d'œuvre*.

Adjectives belonging to several Substantives.—The permission to make the adjective agree with the nearest of two or more substantives of different gender, as in *un courage et une foi nouvelle*, is withheld, the reading now being as follows:—"When a qualifying adjective follows several substantives of different genders, it may always be put in the masculine plural, irrespective of the gender of the nearest substantive, as—*appartements et chambres meublés*."

Tout.—The first part of this article, which permitted the agreement of *tout* before feminine adjectives beginning with a vowel or *h* mute, as well as before feminines commencing with a consonant or *h* aspirate, has been suppressed. It now reads as follows:—"Before the name of a town the word *tout* may agree with the proper noun without any subtle distinction between *toute Rome* and *tout Rome*. Similarly, when a woman is supposed to be speaking, it will be permissible to use either *je suis tout à vous* or *je suis toute à vous*.

"When *tout* is used in the indefinite sense of *chaque*, both *tout* and its accompanying substantive may be used either in the singular or in the plural, as—*des marchandises de toute sorte* or *de toutes sortes; la sottise est de tout* (*tous*) *temps et de tout* (*tous*) *pays*."

The Past Participle with "Avoir."—All that is left of this famous section is as follows:—"When the past participle with the verb *avoir* is followed either by an infinitive or a present or past participle, it may remain invariable irrespective of the gender and number of the objects which precede it, as—*les fruits que je me suis laissé* (or *laissés*) *prendre; les sauvages que l'on a trouvé* (or *trouvés*) *errants dans le bois*. In cases where the past participle is preceded by a collective expression, it may agree with the collective expression or with its complement, as—*la foule d'hommes que j'ai vue* (or *vus*)." We have this much to be thankful for—namely, that we shall hear no more of the oft-quoted *La dame que j'ai entendue chanter*, and of *La chanson que j'ai entendu chanter;* but it is a pity that learners have still to be puzzled with the rule of agreement with verbs reflexive by nature and *vice versâ*.

In respects other than those referred to above, the decree remains as it was, and we need do no more than to refer our readers to Messrs. Hachette's translation, from which we have quoted in the foregoing remarks, and from which it will be readily seen that the chief gains are—(1) in the permission to use *gens* always as a feminine noun; (2) the removal of the anomaly with respect to the plural of proper nouns; (3) the abolition of the hyphen between subject and verb used interrogatively and in compound nouns; (4) in the abolition of the partitive *de* before adjectives and after negatives; (5) in the agreement of *nu*, *demi*, and *feu* when preceding their nouns; (6) in the use of the plural sign with *vingt* and *cent* when used with other numbers; (7) in the use of *c'est* even before plurals, as in *c'est eux;* and, finally, in the suppression of the misleading *ne* after verbs of fearing and restraining, and in other minor points.

THE KING'S FIRST CODE.

Higher Elementary School Minute.—Far and away, the most important of all the changes in this, the initial Code of the twentieth century, is the inclusion therein of the famous Higher Elementary School Minute which was issued on April 6, 1900. This step has been rendered necessary by the Cockerton judgment, which ruled all instruction in Government schools illegal except that provided for by the Code of Regulations for Day and Evening Schools.

Alterations in the Minute.—The Minute itself has been modified as follows:—1. The fifteen years age limit has been so modified as to permit "scholars who are receiving instruction in a school of science at the time of its conversion into a higher elementary school may remain, with the sanction of the Board of Education, notwithstanding the fact that they are upwards of fifteen years of age. 2. The inane condition of commencing with the first year's course, no matter what may be the status of a newly-admitted scholar, is modified by the words, "except with the express sanction of the Inspector." 3. The number of scholars in a higher elementary school will, as a rule, be limited to about three hundred, except in the case of a converted school of science. 4. The grants for ordinary subjects and for practical work are now lumped together, and range from 31s. to 35s. in the first year to from 73s. to 90s. for the fourth year.

Physical Training.—This is the subject of a new schedule, for which, we are told, there is in preparation a "Model Course of Physical Training," which in due time may be obtained from the King's printers. This course is to be a minimum one capable of realisation in even small schools, and must, where possible, be supplemented by systematic instruction in swimming, cricket, etc. This instruction may not occupy any of the time devoted to recreation. It must be of not less than an hour per week, in lessons of not more than half an hour in any one day, preferably in the open air; failing this, in the central hall or in the schoolroom cleared for the purpose; and "the utmost promptitude and the most precise and vigorous movement should be exacted. In the lower classes, in which correct position and movement can only be secured by individual attention, the number of children under the instruction of one teacher at any one time should be small. In the higher classes the number under instruction at the same time may be considerable, provided the teacher is competent."

Exit First and Second Year Pupil Teachers' Examinations and First Year Certificate Examination.—These two reforms will be welcomed by all who have regard for the proper training of the budding teacher. Their purport will be plain from the quotations that follow:—

> "After April 1902, pupil teachers will not be required to pass any examination, after admission, other than that prescribed by Article 41 (*f*). But in each year of their engagement the Inspector must be satisfied that they are properly taught and diligent in their studies, and the certificates specified in Schedule V. must be produced by the managers.
>
> "In 1901 the spring examination will be on 30th March, and the autumn examination on 12th October.
>
> "After the examination in the autumn of 1901, the examination will be held in the spring only.
>
> "After 1901, candidates for certificates will only be required to pass a single examination, which will be equivalent to the present second year's examination."

It is also worthy of note that, even under present conditions, the pupil teacher may pass "some other examination approved by the Board of Education" in place of the pupil teachers' examination.

Cookery for Boys.—The London School Board have long taught cookery to boys living in the neighbourhood of the docks. The Board of Education have legalised this by promising a grant therefor, as in the case of the girls, when the boys taught live in seaport towns.

Prompt Payment of Grant.—"The grant becomes payable on the first day of the month following the end of the school year;" and it is to be inferred from this new addendum to Article 20 that vexatious delays in paying up are to be relegated to the limbo of the bad past.

School Year and Financial Year may differ.—This is set out in a new Article 21, the wording of which is: "The managers may adopt for purposes of instruction an educational year which need not be identical with the school year."

Centre Teachers and Superannuation.—Under Article 36 in its amended form, instructors of pupil teachers will not be considered as qualifying for superannuation "unless five meetings of not less than two hours are held in the morning or afternoon in each week."

Small Schools and Certificated Teachers.—The small school with not more than forty (thirty in previous Code) may not be carried on without a certificated teacher, unless "the circumstances of the school are such as to make it difficult to obtain the services of a certificated teacher." But as it will be easy to plead inability, this really spells retrogression.

Inefficient Schools.—The procedure with respect to these has been modified somewhat, and is now as follows:—

> "86. The school or infant class must be efficient. A school or class is regarded as satisfying this Article if the Inspector does not recommend the withholding of the grant under Article 98, or Article 101 (*a*). The grant will not be withheld under this Article until the following conditions have been fulfilled:—
>
> "(1.) The Inspector must, in his annual report, report the school or class inefficient, and state specifically the grounds of such judgment; and the Board must communicate the report to the managers, and give formal warning to them that the grant may be withheld under this Article, if the Inspector again reports the school or class to be inefficient.
>
> "(2.) The Inspector must, in his next annual report, and after a visit paid with due notice during the last month of the school year, again report the school or class inefficient, and again state specifically the grounds of such judgment.
>
> "(3.) If the managers, within fourteen days after the receipt of the second adverse report of the Inspector, appeal against his decision, the school must be visited, and such adverse report must be confirmed, by a Chief Inspector."

All Schools open to Training College Students.—No managers may now refuse to allow their schools to be used by training college authorities as normal schools: this is the purport of the new Article 91.

The Age for Industrial and Manual Training.—This is fixed at eleven years for both boys and girls; moreover, "attendances made by girls under *twelve* years of age will not, as a rule, be recognised for the purpose of this [Housewifery] grant."

Training College Grants.—"An instalment of £2 is paid on 1st October, 1st February, and 1st May, in respect of every day student enrolled for continuous training as a King's scholar throughout the year.

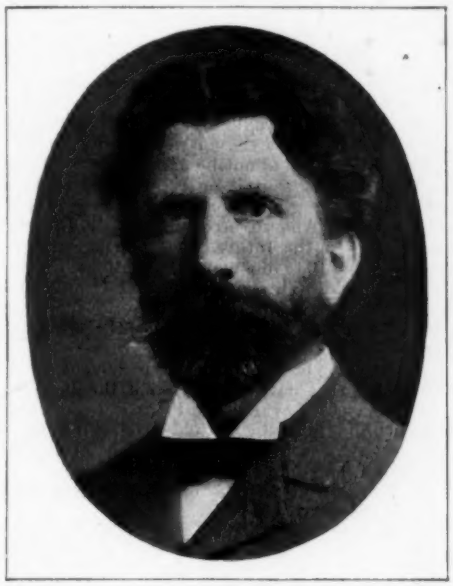
"Separate grants for science and drawing are made to training colleges at the rate of 25s. for every student who has satisfactorily passed through an approved course in mathematics or theoretical mechanics, 35s. for every student who has satisfactorily passed through an approved course in any other subject of science, and 10s. for every student who has satisfactorily passed through an approved course in drawing.

"These grants will be in addition to the grant at present payable under Articles 122–127; but in determining the limit of grant under Article 125 (*a*), the cost of the instruction in science and drawing will be excluded from the certified expenditure, except so far as the cost of instruction in either science or drawing can be shown to be in excess of the grant for science or drawing paid or payable for the same period."

Without further enumeration of minor points, it will be seen that the newest Code is a Higher Elementary and Physical Exercise Code with a wholesome suspicion of examinations. It will therefore be welcomed as setting its face in the right direction, if not progressing so rapidly or so completely in that direction as the more progressive practical teachers would fain see it doing. Still must we look to future editions for the complete realisation of our reasonable wishes and wants.

MR. J. LIBERTY TADD AND NEW METHODS IN ART AND MANUAL TRAINING.

THERE are no government officials in America to overlook the teaching of art, or to reduce it to some common system. Each city, in consequence, works out its own salvation, and points the finger of scorn at its neighbours. We believe that Boston's claim to be considered the "hub" of the art world is somewhat irreverently contested by



MR. J. LIBERTY TADD.

Chicago, while Philadelphia is anxious to know what good can come from a city given up to the "mystery and craft" of the provision trade.

Perhaps this freedom of action is not without its advantages. It gives room for originality, and, incidentally, for the incongruity that makes for humour. Books are written to keep the game alive. Dr. Johnson is known to have knocked down a publisher with a folio (calf bound), and is, in consequence, duly toasted by impecunious authors. And the supporters of different (sometimes indifferent) systems of art teaching whirl their volumes through a troubled air, and call a startled attention to their striking qualities.

In the midst of the confusion it is not always easy to know just where we are. The leader of one school writes his book, and before he hurls the missile at his opponents, calls on one and all to notice that the particular weapon he uses for the demolition and destruction of his adversaries is a totally new thing. On all hands we hear the combatants shouting the same thing; yet during a lull in the fight, and while the professors are shaking the sand out of their hair, we get a chance to pick up some of the broken engines of warfare. It may be due to myopia or to indigestion, but whatever the cause, we cannot, for the life of us, see much difference in the bricks. Some may be sun-dried, some are from the kiln, but they are all of them of the same material, and generally—very dry.

In other words, since art is not a new thing in the world (for the antique cave-men scratched outlines of elephants on scraps of bone long before they knew how to write their alphabet), it is not to be supposed that any one man will discover something entirely new. There are, no doubt, dark interior regions yet to be seen more clearly, but there are no continents on this old world of human faculty that lie awaiting their Columbus.

It was with something like this in mind that we heard of the arrival in England of an art teacher from America—one who brought with him an entirely fresh method, an absolutely new line, that was to drive all preconceived notions of art training into limbo. We heard of triumphal entries into towns in fair Scotland; of grave city fathers at banquets falling into panegyric poetry—in short, of a world disturbed, presaging change.

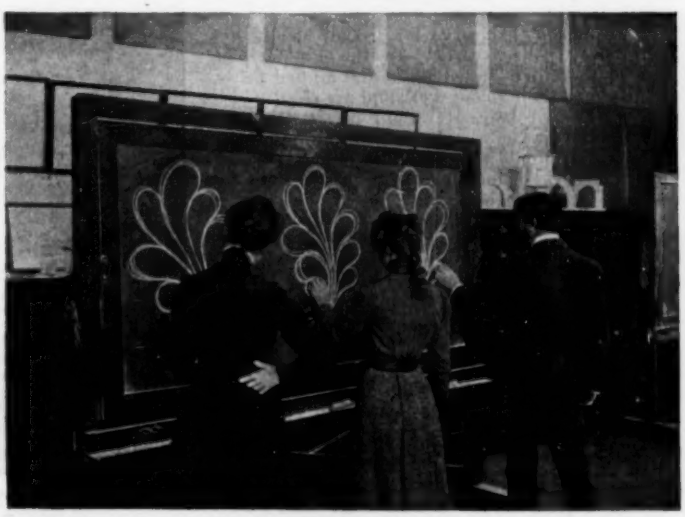
When, however, we heard the teacher himself at the head offices of the London School Board, we were relieved to find that the "new methods in art and manual training" which he has introduced do not claim to be so very new after all. It must not be supposed that Mr. J. Liberty Tadd pretends to have discovered a method of art training that shall reform the world, or make every child artistic. Drawing is with him an educational process. He therefore tries to get down to the bed-rock, by showing upon what psychological grounds his methods are based.

There must first be exercises for getting facility and freedom. Just as in writing and speech we attain a facile use of these methods of expression only after repeated and painful effort, until the actions become automatic, so drawing must become automatic by endless repetition. In other words, our thoughts must be concentrated on the idea we are expressing, and as little as possible upon the mechanical means we use, just as in writing to a friend my thoughts are little, if at all, taken up with the formation of the letters I am writing.

With this end in view, Mr. J. Liberty Tadd insists upon the rapid drawing of circles, spirals, and other simple elements upon the blackboard.

But the brain is made more alert if both hands are used. If I draw a circle with my left hand, I am not only strengthening that half of the brain (the right half) which is concerned with all left-handed movements, but I am indirectly strengthening the left side. As Mr. J. Liberty Tadd pleasingly says: "The reason we do ambidextrous work is for the physical co-ordinations acquired. Biology teaches that the more the senses are co-ordinated to work in harmony in the individual, the better."

It is possible not only to draw with the left hand, but even to draw with both hands at once; and, in addition, to do this without giving thought to the exercise. This Mr. J. Liberty Tadd demonstrated, by drawing on the blackboard rapidly and by talking about other matters at one and the same time.



BLACKBOARD DRILL.

Hand in hand with these exercises in free drawing, the children are to be taught modelling in clay. It is impossible to know form accurately unless the sight is aided and abetted by the touch. The flat form appeals only to the eye;

CARVING ROOM, PUBLIC INDUSTRIAL ART SCHOOL, PHILADELPHIA.

modelling in clay or wax gives cognisance of real form. Not only so, but as a manual training and an educational process it transcends drawing: for both hands are employed upon skilful, delicate operations which, apart from their influences upon the organs of touch, vitalise the mind, helping it towards the attainment of that visualising process that becomes active when once an idea is thoroughly rooted in the mind.

While the children are thus to be trained in facility and grounded in a knowledge of real form, their attention should be drawn to natural objects. The child has a natural tendency towards nature, and should be encouraged to draw (and to model) leaves, fruit, and the creatures about them.

When the children have reached a more mature age, and can be trusted with edged tools, they are to be put to wood-carving, an exercise that demands physical energy, and helps to counteract the evils that come from sedentary habits. There are at the same time a training of the muscles and a healthy mental stimulus that come from real, hard work.

Mr. J. Liberty Tadd has no sympathy with sloyd.

In addition, and *pari passu*, drawing with the brush is advocated. Not only so, but the exercises are to be largely from natural objects, or from good examples of brush-work.

The objects that serve for models should not be merely plaster casts. In the Philadelphia School there are stuffed birds and stuffed fishes, which keep their colour well, and are cheap.

And as to colour, Mr. Tadd pertinently asks what is the matter with butterflies and humming-birds. His pupils therefore mount butterflies on paper, and these form excellent objects both for drawing and for colour.

Mr. Tadd believes entirely in drawing from nature. Every summer, parties of adult students set out for a summer camp among the mountains, where there are endless opportunities for sketching from nature. Here, living in Arcadian simplicity for a few weeks, these (evidently well-to-do) people spend their days in the open air, and study art *inter alia*. The photograph shows them at work sketching horses from the life.

That facility in handling is a great thing; that modelling in clay is excellent for giving a knowledge of form; that wood-carving, or indeed any kind of applied art, is educationally of supreme importance; that only by drawing from actual natural objects can art become more than a dead and lack-lustre exercise—these are all of them truths that need no prophet either from America or Utopia to proclaim. They are not news to this effete country, as Mr. Liberty Tadd no doubt discovered for himself.

But we are not altogether in touch with Mr. Tadd's methods, nor in agreement with all his conclusions.

According to him, facility is of more worth than accuracy. There is nothing like having the courage of your opinions. Mr. Tadd showed us some drawings executed by his pupils in America. They may have been easily and rapidly done; they certainly were not accurate.

Mr. Tadd drew (sometimes with both hands going at once) strange forms, circles, spirals, and a (pinchbeck) Greek *anthemion*. As an exhibition of lightning sketching it was not without merit; and as Mr. Tadd does not claim that his object is to be accurate, we can only suppose that the want of proportion, fitness, or beauty in these sketches falls in with his method.

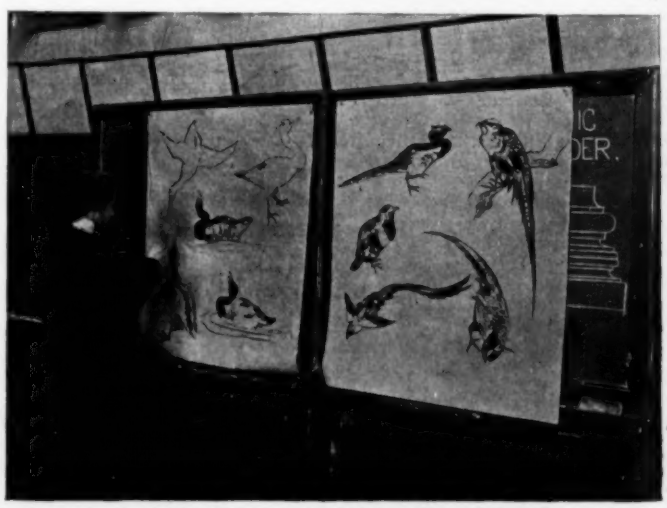
Facility more righteous than accuracy! This is not rebellion, but a revolution. Is not drawing recognised as educational precisely because it cultivates accuracy of eye, backed up by truth of expression? "Surely," we said to Mr. Tadd afterwards, "you correct the errors the children may make?" "No," was the answer; "what is the use of that? The child will find out by experience." Happy prospect! Dogberry has put it on record that to be a well-favoured man is the gift of fortune, but to read and write comes by nature. And so, according to Mr. Liberty Tadd, does accuracy. In the future, let no music-master worry his unwilling pupil to do more than hit at the notes as rapidly as possible. The dancing-master is only to set his pupils spinning like dancing Dervishes. Experience shall teach the one to play like Paderewski, the other to dance like Apollo.

And yet we have our doubts. There have come down to us many studies that have escaped Time, the devourer of all things. We may turn over in the Print Room of the British Museum enough studies by the old masters for the figures in their vast cartoons to show us that they, at any rate, did not undervalue thought, care, and accuracy.

Did not this painful accuracy of great writers and artists alarm gentle Charles Lamb?

"I had thought," said he, "of [Milton's] *Lycidas* as of a full-grown beauty—as springing up with all its parts absolute—till, in an evil hour, I was shown the original written copy of it.....How it staggered me to see the fine things in their ore—interlined, corrected!.....I will never go into the workshop of any great artist again.....no, not if Raphael were to be alive again, and painting another Galatea."

Mr. J. Liberty Tadd has come to the conclusion—a hasty one, we hope—that there is no clay modelling worth men-



BRUSH-WORK FROM JAPANESE DRAWINGS.

tioning in Britain. He took sundry pieces of clay, and after a few dexterous dabs and punches, he held something up before us which he assured us was a duck. We were glad he told us; we were in doubt until he did. Mr. Tadd took

the opportunity of telling us why we degenerate Britishers know next to nothing about clay modelling. Taking a dab

PUPIL TEACHERS MOUNTING BUTTERFLIES—PRIVATE NORMAL CLASS.

of clay, he rolled it in his hand and twisted it into the form of a spiral. This, the lecturer said, was the one test of fitness, and without this good clay modelling was impossible. So now we know. We shall now, having our feet set in the right path, proceed by leaps and rapid bounds, overcoming all the mysteries of the plastic art. This is what we had been waiting for so long. *Eureka! eurekamen!*

We are generally credited with being a mechanical people. Candid friends on the Continent have long been in the habit of telling us we are past praying for: art, poetry, music, and the lighter graces are foreign to our nature. But, add our friends, there is no doubt of your mechanical worth. You may pride yourself on knowing one thing at least. It is believed that most of your thinking is a mechanical act. When, therefore, Mr. J. Liberty Tadd, with a sweet modesty worthy of the occasion, told the assembled three hundred teachers that he could teach more geometry in one hour than any other man in three months, we sighed for "space to breathe, how short soe'er." Even as base mechanics we cannot compare with the Philadelphian industrials. Mr. J. Liberty Tadd thought he had given us food enough for thought. And he had. We were grateful to him for turning on the limelight and treating us to a set of slides showing the Philadelphian methods in action. Here were primary coloured children—"primary coloured" is good—hard at work swinging circles and spirals on the blackboard; there, other children were engaged in modelling; while other slides showed us grown-up people evidently out for a holiday, and enjoying themselves at that.

Mr. Tadd's contention that sloyd is useless, and that the carefully mechanical woodwork favoured in this country is of little worth, calls for no comment. He is consistent in not recognising as a branch of art or manual training anything that requires accuracy and care.

Mr. Tadd's syllabus is excellent. We find fault with his methods in carrying it out. Many admirable photographs were shown of the wood-carving executed by pupils from secondary schools. Yet here were the same unending variations of the debased Greek ornament, which seems to be the only style known to Mr. Tadd or taught under his supervision. One would have thought that the forms of the essentially Christian Gothic art, in which wood-carving was used so freely, would have, at any rate, some part to play in the scheme. What artistic consistency is there in decorating an altar in a Christian church with bad examples of pagan art? Yet Mr. Tadd's pupils are encouraged to do this.

Mr. Liberty Tadd's insistence upon drawing from nature is admirable. This is the Japanese method, and accounts very much for the supreme excellence of the Japs in their drawings from birds and fishes. Have you ever seen Hokusai's sketch of young artists at work in an old-time Japanese art school? All are squatting on the ground. In front of one is a bowl of fish; another has a bird in a cage; near others, fowls are strutting about; while still another, who has been drawing from a monkey chained to a post, has apparently the liveliest corner of the studio, for as he turns to dip his brush in the paint at his side, his simian friend relieves the monotony by seizing the painter by the hair.

The Japanese method would be too exciting for us. So Mr. Liberty Tadd strikes the middle course, and provides stuffed birds and fish as models for his young artists. This seems quite admirable, and we would like to see it generally adopted in Britain.

The book* in which Mr. Tadd states his views and his experiences is now published in a smaller form for the use of students. As the record of an interesting experiment it may be heartily commended. Every art teacher can glean golden ideas from a book so profusely illustrated, and may build up for himself a modified system which shall agree more closely with his own ideas of art and manual training.

We think the fundamental mistake of the method is the confusion of art with manual training. The object of teaching drawing is surely to give the children an appreciation of beautiful form and colour. Art is a thing that exists for itself, and not necessarily as a means to an end. Rapidity or slowness of execution is less than nothing. To compare art with handwriting is to compare a complete building with a woodman's axe: the one is an end, the other a means, an instrument merely. The handwriting of Carlyle was a stumbling-block and an incitement to painful remarks in the compositors' room; but the thoughts so raggedly dressed were none the less fine in art, great in literary worth. Would Mr. Tadd accept as fine art a wretched drawing, simply because the incompetent artist was struggling to deliver himself of a great idea?

In conclusion, we would draw the reader's attention to an article in *The Practical Teacher's Art Monthly* for April, wherein the author traverses both the artistic and the psychological grounds of Mr. Tadd's system. The editor of that journal invites letters from all who are specially

PUPILS WORKING IN SUMMER CAMP, ADIRONDACKS, NEW YORK STATE.

equipped for the purpose, in condemnation or in support of the principles (either from the standpoint of art or of psychology) upon which Mr. Tadd's "New Methods" are based.

* *New Methods in Education* (Student's Edition).

Every Reader of "The Practical Teacher" should see

THE PRACTICAL TEACHER'S ART MONTHLY.

Price Threepence.

Chief Contents of May Number.

A Day among the Greek Vases in the British Museum.
Daily Rounds of a Drawing Inspector.
Answers to South Kensington Examinations.
The Introduction of Handwork into Scotch Schools.
Floral Design for Elementary Schools.
Notes on the New Perspective Syllabus.
Solution to Test Paper in Perspective Drawing.

FROM MONTH TO MONTH.

BY MANY HANDS.

"Quot homines, tot sententiæ."

ANOTHER N.U.T. Conference has come and gone, and some good work has been done in connection with the questions of the Local Authority, the Higher Minute, and the Cockerton Judgment, on which the debates were marked by solid sense and practical insight into the needs of the country. So much for the sedate side of the meeting, which was not without its lighter side. The arrangements were very good from the point of view of business, but I venture to think that more might have been done with a view to spectacular effect. The delegates met in the Aquarium Theatre at Yarmouth, and what a series of possibilities opens before the eye of a good stage manager! For instance, the first tableau, the reception—Mayor, M.P.'s, Executive grouped in the centre, with the civic emblems in front, and the crowd of supporters acting as a background. Then, properly lighted, with the limelight turned on the central figures, ping! goes the manager's bell, and up goes the curtain! Frenzied applause from the crowded house quite naturally follows. Second tableau—installation of new president, and pinning on the badge on the breast of the retiring one. Limelight on the badge! Third tableau—the Angel of Charity, represented by the Countess of Leicester, in centre. In front, ladies kneeling, with outstretched hands holding up to her the purses containing all the benevolent contributions of the year. Background of M.P.'s, Executive, scrutineers, and officials of the Conference. Rapturous enthusiasm! Then, what a fine series of effects might have been obtained by the proper use of a competent orchestra! The fighting resolutions could have been introduced by a "fanfare" or a few blood-stirring strains, and the pathetic appeals made heartrending by "dithery" music. As it was, the orchestral pit was tenanted only by performers on pencil and stylo, whose peace was undisturbed save on one occasion, when an impassioned Celt, who was speaking from the stalls, nearly rolled into it as he staggered under the force of his own periods.

Snacks from Yarmouth.

* * *

AND why not have utilised the prompter? On sundry occasions, when manuscripts were muddled, or threads of discourse broken, speakers cast an agonised look around as if half expecting to hear the well-known saving whisper coming from the P. side. Alas! the oracle was mute, and the "gods" laughed at what were really tragic incidents. On two occasions the prompter was really heard. A gentleman was telling the amphitheatre and the boxes that "he did not want public feeling on the Cockerton judgment to be *manufactured;* he wanted it to be *spasmodic.*" "Spontaneous" came whispering from the wings; but the stalls scorned the aid of the prompter, and "spasmodic" public feeling is still to be. And when a delegate asked, "What becomes of the vote of a life-member of the Benevolent Fund when he dies?" the voice of the prompter was once more heard in the land. The background of the stage was formed of a heterogeneous collection of scenes. Here, again, what a chance was lost! Still much could have been pardoned had the scene-shifters "jined their flats," for Yarmouth is a proverbially windy place, and the Conference Hamlets and Macbeths and Mercutios were often constrained to shiver in the wrong place.

Suggestions.

Some of the representatives were quick to seize on the possibilities of the position, as when one well-known delegate from North London created quite a sensation by rising in the "gods" near the proscenium, O.P. side, to move an amendment. Breathless attention followed the speech that poured down from this "coign of vantage" in paradise.

There is one last bit of stage management that would have produced perhaps the most startling effect ever experienced in any theatre. If all the performance—I mean the speaking—had taken place from the stage, instead of from stalls, pit, boxes, or "colombier" indiscriminately, what a perfect means of applying the closure was to hand in the drop scene!

* * *

THERE were the usual odd figures of speech. One member spoke of "pentagonal" School Boards—that is, the five-membered species; but as he was, to quote his own words, "in a tight corner," perhaps it was the extremely angular disposition of these Boards rather than their many (or few) sidedness that was uppermost in his mind. Another called up visions of a clerical game of Badminton, by declaring that "the child is the shuttlecock of sectarianism;" while a third said "he had taken the Higher Minute in infinite faith"—the Board of Education representing, I suppose, Mr. Squeers, and the Minute a spoonful of brimstone and treacle; result in both cases, intense disgust. One speaker has given the Duke of Devonshire food for thought. He stigmatised the noble Duke's speeches at the New Higher-Grade School in Manchester, when assisting at the opening thereof, as "tainted by that glib and oily art, to speak and to purpose not, generally known as insincerity," which ingenious mixture of metaphors may well stagger our ducal educationist. A previous speaker expressed the situation more felicitously by quoting—

And Oddities.

> "It was all very well to dissemble your love,
> But why did you kick me downstairs?"

Still, quaintness of speech might be expected in an assembly that was received in three languages, and one of whose members, probably under the stimulating influence of the local atmosphere, perpetrated a polyglot display that dazzled everybody. So that no one was astonished, though all were amused, when a rural delegate called, in a strident voice, for "the attendance of *full* children for *all* time," his evident earnestness having brought about a redistribution of his adjectives. His

little blunder was equalled by the mystification of a lady delegate when taken to visit the Yarmouth Rows—that is, the narrow streets, or rather lanes, one hundred and forty-five in number, that intersect the space between the two parallel main streets. It was all explained, however, when she confessed that she thought the word was spelt "Roes."

❧ ❧ ❧

The Novelist and the Teacher.

IT has often been noted that popular novelists deal rather hardly with the schoolmaster—so hardly, indeed, that he of all miscalled persons can feel and sympathise with Shylock in his indignant outburst against the treatment meted out to him by Salarino and the other Venetian fine gentlemen. From the bully or simpleton of Dickens to the prig of Kipling, there is little to comfort the ordinary teacher who feels that he is a man of like passions as his fellow-citizens. Even when there is a passing reference to the greatness of the cause of education, there too often accompanies it the cheap sneer at the educator.

❧ ❧ ❧

Dr. Conan Doyle's Tribute.

ARE we improving? We really think we are. For in that country in which Scott, the kindly and broad-minded, could in past years portray only a Dominie Sampson, we have had in recent years the creation of the immortal Domsie of Ian Maclaren, and the gentle, lovable Miss Ailie of J. M. Barrie. And at the recent belated Edinburgh Burns Club dinner, a nobler tribute than heretofore was paid to the schoolmaster by the orator of the evening, Dr. Conan Doyle, who, with that keen sense of observation with which his writings have familiarised us, had already in one of his books referred to the London Board Schools, which rise conspicuously above the sea of brick houses, as the lighthouses of civilisation in an ocean of humanity. We cannot do better than quote Dr. Conan Doyle's own words.

* * * * *

"If," said he, "there is one class of men upon earth to whom Scotland owes gratitude, it is to the Scottish schoolmaster. As far back as we can trace we find these men, scholarly, earnest, conscientious, poorly paid, with no horizon in life, no ultimate reward save the recollection of duty done. We are proud of the Scottish soldier, of the Scottish colonist, of the Scotsman in many capacities; but these men labour unseen and unpraised at the very root of the national greatness, and the whole fabric of the nation is one huge monument in their honour. They have little career themselves, and yet how many a career have they shaped, and how much indirect glory have they won."

Little wonder that three teachers, who found themselves listening with beating hearts and moistened eyelids to such a noble tribute to their profession, took upon themselves to let the doctor know how much his kindly reference was appreciated by them, and to thank him in the name of thousands of their professional brethren.

❧ ❧ ❧

"Out" o'erbidding "In."

WHILE the powers that be are busying themselves in the reduction of the country's educational outfit, and are allowing some of our most useful schools to be threatened by the mischief of a legal quibbler, the powers that may be are pleading for an extension and even more practical application of the existing arrangements. For we find that "simple rural person," Lord Rosebery—the designation is his lordship's own—speaking at the Mansion House on the need for and value of commercial and technical education. By this he does not mean merely the three R's with a little book-keeping and science, but "education having a direct practical bearing on any different industry or calling." And, with an overt reference to the foreign policy of all the modern powers, he would add a course of commercial and political geography. Now all this is a far cry from the strict letter of the law to which Mr. Cockerton would limit our energies, but it is the least which would satisfy the real claims of the day. It is characteristic of Lord Rosebery that he will never allow himself to pose as an expert, preferring rather the *rôle* of the candid friend. There can be no question, however, as to the intimate knowledge of the points at issue with which Dr. Macnamara, in one of the newest of our contemporaries, expresses his sense of the urgency of the need for a more liberal scheme of national education. We are all Imperialists now, he says: let us be Imperial in this also. We are all Imperialists—so long as the School Board rate is a diminishing or at the least a constant quantity. Such a temper as this is worth nothing, even with the narrowest conception of what Imperialism means. Were the mission of our race simply to make red as much of the map of the world as possible, parsimony in education would defeat it. But it is much more than that. There is a higher ideal than that of merely increasing possession—that of faithful stewardship of what we already hold; and it behoves every one—Big Englander or Little Englander—to see to it that the rising generation is made fit to improve, and not to hide or forfeit, the "talents" which in due time it will inherit.

❧ ❧ ❧

A Curious Antique.

WHAT would be said in these days of an agreement for a schoolmaster like the one subscribed by Mr. Charles Théveny in 1763, in the parish of Jaulgonne, in the north of France? Without translating the whole of the deed, as given in the *Moniteur Scolaire*, I extract the most curious sections. Among his duties fell the following:—

To help the vicar in *all* his functions.

To sweep the church and keep the sacristy tidy.

To keep school all the year save in time of vintage.

To maintain "modesty" among the children when in church, and to hold the school in a healthy place separate from that in which he will exercise his *trade of clogger*.

His remuneration came from many sources, among which were these:—

Eight sous a year from everybody in the parish, as clerk.

Twenty-six sous a year for carrying holy-water into all the houses on Saturdays.

And for the school itself, the following scale of charges was made:—

For beginners, four sous a month. When they could read in "Latin, French, and *civility*," five sous. If they got so far as to be able to read handwriting, six sous; and when they could write themselves, the fee mounted up to seven sous a month.

The most costly article in the establishment of Mr. Théveny, dominie and clogger, was arithmetic, which cost eight sous per month. The requirements of the notabilities of the parish seem rather like

"The fault of the Dutch,
Which was giving too little and asking too much."

Certainly they exempted their clogger-teacher from taxes and from the feudal *impôt* of the *taille*, but then they made him ring the church bell whenever a storm arose!

THE May meetings of the various religious societies are fitly heralded by the annual gatherings of those interested in education. During the month of April this year, the Easter Conference of the N.U.T. has been followed by the meetings of not a few educational societies, which have with one voice echoed the demands of that Conference for a more united and comprehensive system of national education. And this not merely to satisfy the dreams and ambitions of "educational persons," but in the interests of the child and of the country's commercial prestige. Those who plead for a fuller recognition of the need for manual and physical training met almost concurrently with the N.U.T.; and the more vexed question of the relation of secondary education to the State was keenly discussed by the Association of Technical Institutions at their annual meeting in the Fishmongers' Hall, under the presidency of Sir William Hart Dyke. Sir William, himself a quondam representative of "My Lords," put in a strong plea for the legalisation of the higher-grade schools, which find themselves at present in such an anomalous position, saying that he felt like one of the villains of the piece, having often performed the pleasant function—in an official capacity—of distributing prizes, and in other ways encouraged them in their criminal career. A resolution was passed, hoping that the new Education Bill would prevent the waste caused by the overlapping of the work of School Boards and County Councils—a strong amendment, advocating a system of closer union between primary and secondary schools, being withdrawn. We cannot help feeling that the proposition which was carried at the annual meeting of the Eastern Counties Education League at Cambridge, in favour of *one* authority in each locality—not merely each parish or township—being charged with the control of all schools aided by public funds, would produce the most satisfactory solution of the difficulty.

A Strong Consensus.

THE death of Mr. R. D'Oyly Carte has broken another tie which bound us to what was perhaps the brightest era of the brilliant Victorian period. To have catered with so eminent a degree of success for the mere entertainment of millions was in itself a notable achievement. But this was not all. The Savoy school of opera, of which Mr. D'Oyly Carte was the distinguished organiser, had its chief value as a real factor in the educational progress of the nation. The disposition of the British public to regard itself as a music-loving people has asserted itself very powerfully during the past quarter-century. How much we owe, in the matter of the stimulation of so wholesome a sentiment, to the brilliant trio—composer, librettist, and manager—who combined to give us during the seventies, eighties, and early nineties the ever-charming operas of Gilbert and Sullivan, it would be difficult to overestimate.

Pinafore, Pirates, Patience, Iolanthe, Mikado, Yeomen, Gondoliers—what a world of brightness and enjoyment the well-worn names suggest! Those amongst us who are now content with the placid interests of middle age were in the heyday of youth when we found delight in the whimsicalities of Bunthorne, the *naïveté* of Patience, the philosophy of Lady Jane, the dilemma of Strephon, and the anxieties of the highly-susceptible Chancellor; when we footed it to the Sullivanian lancers and quadrilles of D'Albert, and yielded ourselves to the soft spell of the delicious sestette in *Patience* ("Dr. Arne and Purcell at their best," as Sullivan himself enthusiastically bespoke it), or of the quaint madrigal in *The Mikado*.

Savoy Opera and Musical Comedy.

To the light-hearted youth and maiden of to-day, the allurements of up-to-date musical comedy seem attractive enough; but we hope to be forgiven for saying that we are not quite content to accept the catchiness of its music, and the smartness and *équivoque* of its book, as fair exchange for the tunefulness and wit of our dear old comic opera.

NOTES FROM THE NORTH.

King's Scholarship List.

THE first list of the century shows a somewhat startling decrease in the number of candidates presented for examination. We give the figures for the last three years for the sake of comparison:—

MEN.

	Presented.	Passed.						Failed.
		1st Class.	Arts. 70, 95, etc.		2nd Class.	3rd Class.	Total.	
			P.T.'s.	Non-P.T.'s.				
1898	341	92	21	16	94	69	292	49
1899	327	82	28	10	107	69	296	31
1900	297	67	47	51	57	50	272	25

WOMEN.

	Presented.	Passed.						Failed.
		1st Class.	Arts. 70, 95, etc.		2nd Class.	3rd Class.	Total.	
			P.T.'s.	Non-P.T.'s.				
1898	1304	308	48	17	400	246	1079	225
1899	1343	302	78	17	444	300	1141	202
1900	1239	230	152	61	362	255	1060	179

From these figures it will be seen that there is a decrease in the number of men who presented themselves for examination this year—of 30 from last year, and of 44 from 1898, representing in the latter case a decrease of fully 12 per cent. No doubt this decrease is largely caused by the slowness of promotion to headships, and the smallness of salaries offered by many School Boards. We note that year by year the number of candidates who are adopting the path of less resistance, shall we say, and are taking advantage of the Leaving Certificate and University Preliminary Examinations, is increasing. Particularly is this the case with non-pupil teachers. Does this mean that the day of apprenticeship for teaching, as for other businesses, is fast going?

With regard to the figures for women, it is also worthy of note that there is this year a decrease of fully 100 in the number presented for examination. In their case the contributory causes may be said to be the smallness of salaries, and very largely the lack of sufficient college accommodation. Again, it is to be observed that the number of non-pupil teachers taking other than the Scholarship Examination is on the increase. Both in the latter case and in the case of the men, many of these candidates will take the classes at the universities of Aberdeen and St. Andrews as King's students.

We have also tabulated the first hundred of the men and of the women as to the districts from which they come. Glasgow, with its well-organised centre, takes a very good place.

	North.	South.	Aberdeen.	Edinburgh.	Glasgow.	Total.
Men.....	19	47	3	5	26	100
Women.....	15	23	17	7	38	100
Total.....	34	70	20	12	64	200

Of the 67 men in the First Class, Glasgow has 21, taking, among others, the second, third, fourth, fifth, sixth, seventh, and ninth places. It has not, however, done so well in the case of the women.

The Highlands and Islands have taken the places of honour. The island of Skye has got the first and the eighth men, while Oban has the first and the twenty-ninth women. All honour to the head-teachers who have trained them.

The New Code. Very few departures have been made from last year's Code, and it is perhaps just as well, inasmuch as opportunity has not yet been given to sufficiently test its provisions. A very important alteration, however, is about to be introduced with regard to the examinations of King's scholars and students. After the present year the examination at the end of the first year will be discontinued.

Very great changes have been made in the drawing schedule, but these are dealt with in full in this month's *Art Monthly*. It is to be noted in this connection that efficient instruction in drawing is to be given by teachers recognised by the Department as qualified to give instruction in the subject. The temporary note with regard to drawing qualifications has been withdrawn.

Parliament and Scottish Education. In answer to a question asked in the House of Commons by one of the Irish members with reference to the fact that the Boards of Education in Ireland and England recognised the Scottish qualification of teachers, and that the English Code now recognises the Irish certificate, but that the Scotch Code, while recognising the English certificate, refuses to attach any value to the Irish certificate, the Lord Advocate replied that, as at present advised, the Scotch Education Department saw no sufficient grounds for any alteration of the existing practice with regard to Irish certificates.

The London correspondent of the *Scotsman*, who is usually well informed as to the intentions of the Government, gives it as his opinion that the demand of the teachers for greater security of tenure will be dealt with in the English Education Bill, which in official quarters it is still hoped to pass this session. Sir John Gorst's answer, that the question was under legal consideration, shows that, if the position of teachers in relation to the school authorities is to be as the National Union proposes, there must be legislation. In that legislation Scotland will be interested as much as England, for whatever privilege is given in one country must have its equivalent in the other. The demand here referred to is that the teacher should have the unqualified right of appeal from any decision affecting his tenure of office. This, in its crude form, he says, strikes at the essential rights of School Boards. It would make the teacher independent of the body by whom he is elected. It might deaden the educational administration of a district, and it might make the teacher the dominant authority. It will therefore, he thinks, have to be embodied in carefully-prepared provisions, and the concessions may have to be allied with the creation of larger areas of administration. At any rate, it is not likely that the Government will bring in the Education Department and make it the appellate tribunal, as the Scottish Department suggested one or two years ago. We have always advocated larger areas, and the teachers would be the first to welcome such. As a matter of experience, it has been found that petty parochial jealousies have been at the root of many, if not all, of the unjust cases of capricious dismissal that have taken place. The wider areas would remove this cause. The Institute has not given any indication of a preference for the appellate tribunal: it has rather left the door open for any method that would put an end to these pernicious cases. The "wider area" has long been felt by many as the cure not only for this crying evil, but also for many other and no less clamant evils.

NOTES ON AMERICAN PRIMARY EDUCATION.

BY E. D. FEAR, B.A.

"An' close to every door, John,
A school-house an' a steeple."
JAMES RUSSELL LOWELL.

AMERICANS seem to regard expenditure upon education as the best investment the state can make.

Hence we find in America:—

(*a*) Palatial school-buildings with large and airy class-rooms.

(*b*) Generous equipment of the schools as regards furniture and apparatus. Blackboards are fixed all round the walls of each classroom.

(*c*) Education is free right through to the university for all who possess the ability and the desire to procure it.

Special attention is paid in the primary schools to developing the sensory and motor areas, as distinct from the thought areas, of the brain. Nature-study, drawing, and manual work are accordingly considered of higher importance than the three R's.

The encouragement of originality plays an important part in the school routine. There is no controlling central authority such as we have. "The authoritative management is reserved to and exercised by the several states." Hence we find widely-varying systems and curricula.

Much of the teaching is done out of doors. The favourable climate, of course, assists the Americans in this respect. In England, according to them, we only get samples of weather, so we are unable to indulge in *al fresco* methods as freely as they.

(*a*) In the towns the scholars are taken to the parks to learn botany.

(*b*) Lessons in history are given at street corners around the statues of heroes like Washington and Lafayette.

(*c*) Lessons on the growth of public institutions are given on the brink of the canal, within the ice-house, at the municipal electricity store-house or gas-works, and inside the mill.

(*d*) The disintegration of rocks and the work of rivers are dealt with where actual evidence is forthcoming.

(*e*) Lessons in natural history are given in the zoological gardens and at the museums.

Froebel's maxim—"To learn by doing"—is acted upon very widely.

(*a*) The children measure objects in their number lessons. They go into the fields and playgrounds with the measuring chain. They compare the sizes of geometric models.

(*b*) The scholar illustrates arithmetical exercises, such as, for example, those in fractions and ratio, by cutting out pieces of coloured paper and affixing them by the side of the worked sums.

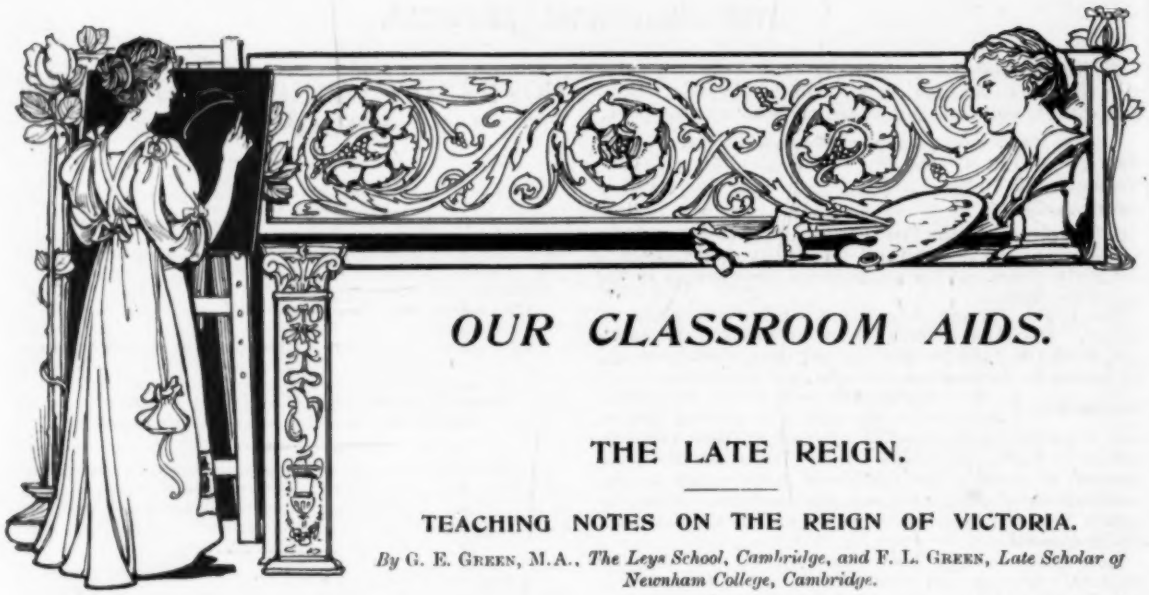
Composition, oral and written, is considered of high importance. Handwriting and spelling are apparently regarded as of much less moment. Essays and stories are usually illustrated by pen and brush. The Americans are very anxious to cultivate smartness in expression both with the tongue and the pen.

Nature-study is the centre-piece of the curriculum in the lower grade schools.

Expression of thought by drawing is encouraged from the first. Later on painting, modelling, and wood-carving are used as means of expression.

An easy and natural kind of discipline is enforced. The children in the kindergartens, for instance, sit on *chairs* at *tables*.

Accuracy and finish are far from being the *ultima thule* of the teacher. These, it is thought, will come naturally with the physical and mental development of the scholar.



OUR CLASSROOM AIDS.

THE LATE REIGN.

TEACHING NOTES ON THE REIGN OF VICTORIA.

By G. E. Green, M.A., *The Leys School, Cambridge, and* F. L. Green, *Late Scholar of Newnham College, Cambridge.*

III.—THE EXPANSION OF THE BRITISH EMPIRE.

I. EUROPE.

1. **Cyprus.**—Acquired by the Treaty of Berlin, 1878, it has not been transferred to England absolutely. It is held only for administrative purposes, and only while Russia retains Batûm, Kars, and Ardahan. Its area is 3,584 square miles. Its population is 209,286. It is governed by a High Commissioner and Councils. If the Turkish Empire were to break up, the nearness of Cyprus to the coast of Asia Minor might make it a valuable base of operations.

2. **Ionian Islands,** which had been under the protection of Great Britain since 1815, were ceded to the kingdom of Greece in 1864.

II. AMERICA.

1. **Canada.**—Reform agitation in England, and the prosperity of the United States under a republic, led to movements in favour of independence in 1837. Papineau raised a rebellion in Lower Canada, and the British Government dispatched Lord Durham, with full powers as High Commissioner, to examine into Canadian affairs. His report led to the passing of the Reunion Act of 1840. The two provinces of Upper and Lower Canada were once more united by this Act, and the Colonial Ministry was made dependent on the Colonial Parliament instead of on the Home Government. Under Lord Elgin's government (1847–1854), the church lands were surrendered to local authorities for educational and social uses. A feeling for federation led to the British North America Act of 1867, by which Ontario, Quebec, New Brunswick, and Nova Scotia were formed into one dominion. Each province was to have its own local government, and over all was constituted a Dominion Government, consisting of the Governor-General, representative of the Sovereign, and a Federal Parliament, comprising a Senate appointed by the Governor-General, and a House of Commons elected by the provinces. The boundaries of Canada, at the beginning of the Queen's reign, were not finally settled. In 1842 the frontier of Maine was settled. In 1846 the forty-ninth parallel of latitude was accepted as the boundary from Lake Superior to the Pacific.

The British North America Act of 1867 provided for the incorporation in the Dominion of such other colonies as might desire to join.

In 1870 Manitoba applied for admission.

In 1871 British Columbia threw in its lot with the Dominion.

In 1872 Prince Edward Island was added.

In 1869 the Hudson Bay Company's territories were purchased by the Dominion.

In 1870 the admission of Manitoba led to the rebellion of Louis Riel.

The Canadian Pacific Railway was completed in 1886.

The repeal of the Treaty on Commercial Union between Canada and the States was brought about in 1866. It has led to a great increase in Canadian trade.

2. **The West Indies.**—In 1846 the commercial ruin of the West Indian Islands, initiated by the repeal of slavery in 1833, was completed by Free Trade in sugar. The introduction into commerce of the beetroot sugar of France and Germany, and the cultivation of the sugar-cane in Australia and other countries, have nearly driven West Indian sugar out of the market. In 1871 the Leeward and Windward Islands were federated. France abolished the slave trade in 1848, Portugal in 1851, Holland in 1860, the United States in 1864.

III. ASIA.

1. **India.**—*The Government of India.* India consists of British India, the Protected States, and the Independent States. British India is divided into provinces, under a Viceroy, assisted by a Council of six ministers appointed by the Crown. The Viceroy is responsible to the Secretary of State for India, who is advised by a council of fifteen sitting in London. The Indian Budget must be accepted by the British House of Commons every year. Madras and Bombay have each a separate Governor. Bengal, the North-West Provinces, and the Punjaub are under Lieutenant-Governors. Assam, Oudh, the Central Provinces, and Burmah are under Chief Commissioners. In the Native States of India the Viceroy is represented by political residents, who advise the native rulers.

Wars:—

In 1839, Great Britain, thinking her interest in India threatened, interfered in a disputed succession in Afghanistan, and war ensued. The British army was almost annihilated on its way to Jelalabad, but General Pollock forced the Khyber Pass, and relieved the remains of the army at Jelalabad. The war was ended by the capture of Cabul by the British army in 1842.

In 1843 Sir Charles Napier conquered Sindh. It was annexed in the same year.

In 1845 and 1849 two Sikh wars led to the annexation of the Punjaub.

In 1856 the kingdom of Oudh was added to British India.

In 1857 the great Indian Mutiny broke out at Meerut. Delhi was taken in 1857, and Lucknow was relieved

in the same year. The Mutiny was suppressed in 1858 by Lord Clyde. The East India Company was abolished, and the government transferred to the British Crown, with a Minister of State and Council. The Queen was proclaimed in India, at a great Durbar or gathering of princes at Allahabad, on November 1, 1858. On January 1, 1877, Queen Victoria was proclaimed, in India, Empress of India, with great solemnities.

In 1878 a British army invaded Afghanistan. In August 1880 the British were forced to withdraw from Cabul, but their influence was restored by Roberts's celebrated march to Kandahar.

In 1885 we annexed Upper Burmah, and exiled its king, Thebaw.

Governors-General of India:—

Lord Auckland, 1836–1841.—He endeavoured to obtain a definite and secure frontier on the north-west of British India, and caused the first Afghan War by putting forward a dethroned Ameer (Shah Sujah) in opposition to the reigning prince at Cabul, Dost Mahommed.

Lord Hardinge, 1844–1848.—He served in the Sikh War.

Lord Dalhousie, 1848–1856.—An administration characterised by great reforms. He founded the Public Works Department, opened the Ganges Canal and the first Indian railway. He promoted steam communication, and introduced cheap postage and the electric telegraph. His policy of annexation was revenged by the Mutiny.

Lord Canning, 1856–1862.—He suppressed the Mutiny, and adopted a policy of political justice and religious toleration.

Lord Elgin, 1862–1863.—He succumbed quickly to overwork.

Sir John Lawrence, 1863–1869.—During his administration India was afflicted by the terrible Orissa famine.

Lord Mayo, 1869–1872.—He recognised Shere Ali as Ameer of Afghanistan.

Lord Northbrook, 1872–1876.—He alleviated the famine of Lower Bengal in 1874 by Government relief and public works.

Lord Lytton, 1876–1880; Lord Ripon, 1880–1884; Lord Elgin, 1894–1898; Lord Curzon, 1899, have all been characterised by public spirit and energy.

2. **Labuan.**—Labuan became a Crown Colony in 1846—that is, its government is administered by its Governor alone, who is responsible to the Home Government.

3. **Aden.**—A military post under the British Government, acquired in 1838. There is a British Resident subordinate to the Government of Bombay.

4. **Perim.**—An island acquired in 1857, and subordinate to Aden. The Kuria Muria Islands form a telegraph station, and are also subordinate to Aden.

5. **The Malay States** form a British Protectorate since 1874. The Governor at Singapore exercises advisory authority over the Protectorate. They were federated under one Resident in 1896. Christmas Island, our newest foreign possession, is now under the Straits Settlements Government, and a resident magistrate has just been dispatched thither from Singapore.

6. **Sarawak.**—Sir James Brooke founded an independent state under his own sovereignty in 1840. A company of British merchants gained cessions of land in the northern part of the island, 1877–1878. The Chartered Company of British North Borneo took over these rights, and is quasi-independent. The government is a British Protectorate.

7. **North Borneo.**—North Borneo was acquired in 1881. The government is a Protectorate.

8. **British New Guinea.**—It was proclaimed a Protectorate in 1884, at the instance of Australia, for fear a territory within eighty miles of Queensland should fall into the hands of a hostile European power. It became a Crown Colony in 1888.

9. **China.**—Hong Kong is our principal naval station in Eastern Asia. It was acquired, with Kowloon and Lema Islands, in 1842, by the Treaty of Nankin. It has a population of 221,441. Two Chinese representatives sit on the Legislative Council.

Wei-Hai-Wei is an Admiralty post acquired by treaty in 1898, at the close of the war between China and Japan.

IV. AUSTRALASIA.

1. **Australia.**—In 1788 the first station was established at Port Jackson (Sydney), in the district called by Cook New South Wales. The discovery of the Bathurst pastures made it the most profitable sheep-farming country in the world.

Brisbane, founded as a convict station in 1826, developed into the colony of Queensland in 1859.

A convict settlement on the Swan River, founded in 1829, became the centre of the colony of Western Australia.

In 1837 the town of Melbourne was founded, and after the discovery of the Ballarat goldfields in 1851, flourished as the capital of Victoria.

Van Diemen's Land, or Tasmania, a convict settlement in 1804, was erected into a separate colony in 1856.

South Australia was founded in 1836, and New Zealand in 1839, on Wakefield's principle, that the right way of founding colonies was to send out men of every class in society.

Removal of Convicts.—After 1840 no more convicts were sent to New South Wales. In 1868 transportation to Australia ceased.

The Australian Government Act of 1850 empowered the English Government to grant these colonies the right of electing their own Parliaments, with ministers who should be responsible to them instead of to the Home Government. South Australia, Victoria, New South Wales, Tasmania, and Queensland quickly did so. New South Wales has important coal-fields and manufactures. Queensland is rich in minerals, and South Australia is a great wheat-growing province.

2. **New Zealand.**—It consists of three islands—North Island, South Island, Stewart Island—and islets round the coast. It was acquired by settlement and treaty, 1839–1840. Originally divided into six provinces, the colony received a common government in 1876. Minerals, wool, and frozen meat are the sources of its commercial prosperity.

3. **The Fiji Islands.**—The Fiji Islands were acquired in 1894. They are a Crown Colony.

Australian Federation.—The movement for Australian federation began in 1852. In 1886 a Federal Council, sanctioned by the Imperial Parliament, met at Hobart. In 1889 a National Convention was called together for the purpose of devising and reporting upon a scheme of federal government. In 1891 a Convention met at Sydney to frame a constitution for the Commonwealth of Australia. The Federation became an accomplished fact on the first day of the twentieth century.

V. AFRICA.

1. **South Africa.**—(1.) *Cape Colony.*—Our original possessions at the Cape of Good Hope, taken from the Dutch in 1814, were at first merely a station on the route to India. Now it is an important mining and farming colony. The eastern province was formed in 1820. Natal was part of the colony in 1843–1856. Kafirland, conquered in 1853, was joined to Cape Colony in 1865; the diamond fields of Griqualand West were acquired in 1870, and united to Cape Colony in 1877. Zululand was acquired in 1879. The Cape Parliament was established in 1854. It consists of a Legislative Council and a House of Assembly. But as the Executive Government remained independent of the Legislature, the constitution was that of a Crown Colony. Responsible government was granted in 1872, with the full powers exercised by the Parliaments of Canada and Australia.

(2.) *Natal.*—In 1839 the Boers began to occupy Natal. They founded Pietermaritzburg. Difficulties between the Boers and the Kafirs soon threatened Cape Colony. The Home Government resolved, in 1842, to occupy Natal. It was proclaimed a colony in 1843. From 1845 to 1856 Natal formed part of Cape Colony for administrative purposes. In 1860 it became a Crown Colony. Responsible government by a Governor and Parliament was granted in 1893.

(3.) *Zululand*, in 1887, became subordinate to Natal.

(4.) *Rhodesia.*—Rhodesia comprises the Protectorate of Bechuanaland—the government of which is administered by native chiefs, under the supervision of British officials—

and the country of the British South Africa Company, the chartered company formed in 1889 for the purpose of opening up trade and civilising the country.

(5.) *Orange River Sovereignty.*—The Boer population between the Orange River and the Vaal sought British imperial protection. In 1848 it was formally taken over as a dependency of the Crown, under the title of the Orange River Sovereignty. In 1854 it was deliberately abandoned by the Bloemfontein Convention, to save the risks and expense of its defence. It was reannexed by Great Britain in 1900. The discovery of diamonds near the Orange River, in 1867, has made the state economically important.

(6.) *The Transvaal.*—The Transvaal was recognised as an independent republic in 1852. It was annexed by Great Britain in 1877, but regained its independence, under the suzerainty of the Queen, in 1880. In 1895 some Uitlanders and Dr. Jameson, the Administrator of Rhodesia, conspired unsuccessfully to overthrow the Dutch Government and bring the Transvaal once more under British authority. In the autumn of 1899 Kruger declared war, with the view of securing a united Dutch South Africa. The Transvaal was annexed by Great Britain in 1900. Gold was discovered on the Witwatersrand in 1884.

2. **Egypt.**—Since 1882 Egypt has been controlled and defended by the British Government. The Soudan was ruled by General Gordon, 1874–1879. After his death in 1884, for fourteen years the Soudan was abandoned to the Mahdi's followers. In 1898 Sir Herbert Kitchener destroyed the army of the Mahdi's successor at Omdurman, and recovered the Soudan for Egypt.

3. **West Africa.**—(1.) The older English colonies are *Gambia* (1664), under an Administrator and Legislative Council, and *Sierra Leone* (1791), with a Governor and Executive and Legislative Councils.

(2.) *Lagos*, a small trading station, was acquired in 1861.

(3.) *Gold Coast Colony*, founded in 1868, is under a Governor, with Executive and Legislative Councils.

(4.) *The Niger Coast Protectorate* (1884) is under an Imperial Commissioner. The Royal Niger Company's territory is governed by the council of the company.

4. **East Africa.**—(1.) *Zanzibar and Pemba.*—In 1888 we acquired half the dominions of the Sultan of Zanzibar. It is governed by the Sultan and the British Consul-General, in pursuance of an agreement made with Germany in 1890.

(2.) *East Africa Protectorate.*—It was formed in 1888, and is governed by an Administrator under the Imperial Government, the company having been bought out in 1895.

(3.) *Somaliland Protectorate.*—It was acquired in 1886–1887, and is opposite Aden.

OUR EMPIRE SUPPLEMENTS.

IV.

THE COMMONWEALTH OF AUSTRALIA.

(*See Supplement presented with this Number.*)

THE departure of the *Ophir* for Australia, carrying the future King and Queen and a splendid retinue, filled with the highest hopes and keenest anticipations of pleasure, proceeding on a right royal progress to put the coping-stone on a great national work, recalls to the mind a far different voyage. On May 13, 1787, a fleet of eleven small vessels left these shores with no royal salutes or joyous demonstration; for, of the 1,015 passengers, 800 were convicts—condemned criminals whom England was casting out as unfit to live within her shores. They were banished to a distant and unknown land, and there was no joy or enthusiasm in their minds, for the prospect before them was gloomy, sad, and invested with all the terrors of the unknown.

And what a contrast between the England of that time and the land as we know it! Then England had not long concluded, in sullen and reluctant despondency, the treaty which tore from her the only colonies she had made. Canada, indeed, remained to her, but it was regarded as of little importance—"a few *arpents* of snow," as Louis called it. A few of the West Indian islands, one or two trading stations on the west coast of Africa, and some parts of India over which Clive and Hastings had extended the rule of the East India Company, were all that then existed of our present mighty empire.

At home there was a vicious and depraved aristocracy, and a miserable, enslaved peasantry bound to the soil and governed by harsh laws, which did more to produce criminals than honest men.

And if the change in England is great, in Australia it is marvellous. What was known of it then? Torres had blundered through the strait which bears his name, without touching at the mainland; Abel Tasman had traced some of the western coast and discovered Tasmania (Van Diemen's Land, he called it) and New Zealand; Dampier, in a British ship, had visited the western shores of New Holland, as it was called; but so vague were the ideas of the time, that Tasmania and New Zealand were considered part of the great Terra Australis which was supposed to occupy a large part of the Southern Pacific.

Captain Cook circumnavigated New Zealand, and proved that it was a group of islands; and then, sailing north-west, struck the eastern coast of Australia somewhere near Gippsland, in Victoria, and traced it as far north as Cape York. It was owing to the enthusiastic account which the naturalist Joseph Banks gave of Botany Bay that that spot was selected by the Government as a convict station, now that the American plantations were no longer available as such.

On January 26, 1788, the unhappy pioneers landed—not at Botany Bay, which was found to be unsuitable, but in the magnificent landlocked harbour on the shores of which Sydney now stands.

The first few years were times of difficulty. Seeds planted refused to grow; the cattle ran away; a series of droughts ruined what little attempt was made at agriculture; and the colony hovered on the verge of starvation. The officers and men of the New South Wales Corps—a body specially enlisted to act as guards to the convicts—earned for themselves the nickname of the "Rum Corps," from their illicit dealing in spirits, and seriously hampered the work of the governors, rising at last in open rebellion; and it was not till Colonel Macquarie arrived in 1810 that any advance was made. It was during his term of office (1813) that the Blue Mountains were first passed, and the fertile Bathurst plains discovered. Up till then the colonists had been confined to the strip of seaboard between those mountains and the sea. Henceforward a policy of expansion and exploration was steadily followed.

Captain MacArthur of the "Rum Corps," an able but cantankerous man, first recognised the suitability of the country for sheep farming, and introduced a few merino sheep, from which he raised a breed famous for the quantity and texture of their wool.

Into all the difficulties and troubles of the early settlers—for free settlers were now coming in increasing numbers—it is unnecessary to go. The land question, the suppression of bushrangers, the natives, and the importation of convicts, were questions which had to be settled. Free settlers naturally objected to having the scum of English prisons sent out to them. In 1851 transportation to New South Wales was finally abolished. In 1842, after a long agitation, representative government was granted.

Meantime the exploration of the country was steadily proceeding. Oxley and Cunningham examined a large part of what is now Queensland, and it was on their recommendation that Moreton Bay was made a convict settlement. Hume travelled overland to Port Phillip, Sturt traced the Darling and Murray, Mitchell traversed much of the land lying between those rivers and the sea, and Leichardt plunged into the interior, and was lost.

But it was the discovery of gold, in 1851, which first attracted settlers from all parts of the world to the Bathurst plains. Tales of huge nuggets found, of fortunes realised in a week, led to a rush of immigrants, who, however, ultimately found that agriculture and stock-raising yielded much surer, if slower, returns, and consequently abandoned the pick and shovel for the plough and stock-whip.

TABULATED STATISTICS, ETC.

STATE.	Date of Founding.	Responsible Government Granted.	Area in Square Miles.	Population.	Towns, etc.
1. **New South Wales**	1788	1842	310,700	1,357,050	**Sydney**, Newcastle, Broken Hill, Bathurst, Goulburn, Paramatta, Maitland. Value of imports, £25,000,000. Value of exports, £28,000,000. Transit from London, 42 to 50 days.
2. **Queensland**	1824 (separate colony 1859)	1859	668,497	482,400	**Brisbane**, Rockhampton, Maryborough, Townsville, Ipswich, Toowoomba, Charters Towers, and Gympie. Value of imports, £7,000,000. Value of exports, £12,000,000. Transit from London, 44 to 50 days.
3. **Victoria**	1834 (sep. colony 1850)	1850	87,884	1,180,400	**Melbourne**, Ballarat, Bendigo, Geelong, Castlemaine. Value of imports, £18,000,000. Value of exports, £19,000,000. Transit from London, 40 to 47 days.
4. **Tasmania**	1803	1855	26,215	182,300	**Hobart**, Launceston, Zeehan, Ulverstone. Value of imports, £1,800,000. Value of exports, £2,000,000. Transit from London, 36 to 40 days.
5. **South Australia** ...	1836	1856	903,630	370,700	**Adelaide**, Port Adelaide, Gawler, Kapunda, Kooringa, Port Darwen. Value of imports, £7,000,000. Value of exports, £9,000,000. Transit from London, 38 to 44 days.
6. **West Australia**	1829	1890	975,920	171,022	**Perth**, Fremantle, Albany, Geraldton, Coolgardie, Kalgoorlie. Value of imports, £5,000,000. Value of exports, £7,000,000.
			2.872,846	3,743,072	Transit from London, 28 to 32 days.

Tasmania was first occupied in 1803, owing to the apprehension that the French were on their way to take it. For many years the island was used as a convict station for the worst class of criminals; but as a better class of settlers arrived, attracted by the climate, scenery, forests, and superb agricultural land, an agitation was set on foot to abolish transportation and obtain a separate government. The latter object was attained in 1825, but it was not till 1853 that no more convicts were sent.

The first settlement in **Victoria** was made by the brothers Henty, in 1834, at Portland Bay; but to Batman and Fawkner is due the foundation of a settlement on Port Phillip. The former, a Tasmanian bushman, landed there in 1835, and bought 600,000 acres from the natives for a few blankets, knives, looking-glasses, etc. Where Batman pitched his tent, only sixty-five years ago, in the primeval forest, now stands Melbourne with its half-million inhabitants. The Port Phillip settlement was an unruly baby. It was born in opposition to the wishes of the Sydney authorities, and very soon began to clamour first for representation on the Sydney Council, and then for a separate government. The former was granted in 1847, the latter in 1850.

The discovery of gold in New South Wales nearly depopulated Victoria; but the tables were turned when richer gold-fields were discovered to the north of Melbourne, and an unparalleled rush took place: 65,000 miners came in 1851, and in five years the total number was 337,000. These were not always desirable additions to the population, for 11,000 ex-convicts came from Tasmania in seven months, and there were many disputes—culminating in an open rebellion—between the authorities and the miners before the mining laws were adjusted to the satisfaction of all parties.

Queensland, like the mother colony and Tasmania, was at first a convict station, Moreton Bay being the first position occupied; but soon free settlers came, and, seeking for pasturage, gradually spread over all the best parts. The discovery of gold in 1858 led to the usual "rush," and the increased number of settlers to the demand for separate government, which was granted in 1859.

South Australia was colonised in 1836, directly from England, under a plan devised by Gibbon Wakefield, his theory being that land should not be sold too cheaply. If every one could get land there could be no wealthy class, and therefore no real advance. Land should be sold at a good price, and the proceeds used to import young labourers and their wives. However plausible these ideas look on paper, they did not work satisfactorily, and the young colony had a hard struggle to live at all. It was not till Sir George Grey initiated the policy of decentralisation and extension, and the discovery of the famous copper mines of Kapunda and Burra Burra brought wealth to the colony, that any apparent progress was made. Separate government was granted in 1856.

West Australia was colonised also by a company, the first settlement being made in 1829. Detailed schemes were drawn up in London, but, as with South Australia, rules and regulations were more easily made than carried out. Up till 1850 there was complete stagnation. In that year convicts were sent out to the colony to supply the necessary labour. Advance was still slow. The pearl fisheries proved a profitable industry, and some progress was made in agriculture, but it was not till the discovery of the Kimberley, Coolgardie, and Southern Cross gold-fields that the colony moved ahead. It was in 1890 that it received representative government.

Such were the circumstances under which the six colonies were founded. Of the many explorations into the hot furnace of the interior we have no space to tell, neither is it possible to say anything of the strange indigenous fauna and flora. It is to the valuable deposits of gold, silver, copper, tin, lead, coal, etc., to the pastures which support millions of sheep, cattle, and horses, to the forests of eucalypti and jarrah, to the alluvial and fertile river basins, and more especially to the indomitable energy and pluck of the people, that Australia owes its rapid advance. The onward movement has not been uninterrupted. Prolonged droughts, followed by devastating floods, have again and again checked the prosperity of the squatter; forest and bush fires, like that which devastated hundreds of miles in Victoria in 1851, have ruined many a colonist; and severe commercial and financial depressions have more than once tried their endurance. Yet, through all, advance *has* been made, and Australia is fast becoming a powerful nation.

Although in early days it was found necessary to form separate governments, owing to the great distances and difficulties of communication between the colonies, and to

the variety and diversity of local interests, the necessity for some bond of union, some understanding regarding national matters, was early felt. By the middle of the century, meetings of delegates had been held to settle disputes. In 1885 a Federal Council came into existence, to which Queensland, Victoria, West Australia, and Tasmania belonged—South Australia joining for a time. As this council possessed no judicial powers, and could only advise measures, it was not considered as of much importance. In 1887 a conference of premiers in London adopted a scheme of national defence. The Convention held in Sydney in 1891 brought Federation to the fore, and in 1895 another Convention drew up a Federal Enabling Bill, which was submitted to the electors of the colonies. After much discussion it was finally adopted, and came before the British Parliament in 1900, and, after a few modifications on legal points, became law. The Commonwealth of Australia thus came into existence on January 1, 1901.

The advantages of such a step are obvious: unity of tariff, of measures for national defence, of railway and postal service, of immigration, banking, copyright, marriage and divorce laws, of means for irrigation, increases the strength of the country, and does away with much unpleasant friction. Under the terms of the Act, the colonies are states. There are two Houses—a Senate, consisting of six members from each state; and a House of Representatives, elected on the basis of one member for 50,000 electors. The capital is to be in New South Wales, but not within a hundred miles of Sydney. Many sites have been suggested, of which Orange, Yass, and Eden are most popular; and the latter will probably be the final selection.

The Duke of York will formally open the first Parliament, which will have plenty of work to do, for there are many questions which have to be settled, the most important of which is perhaps the question of tariff.

The federation of Australia is another step towards the federation of the Empire. Happily, the days have gone by when statesmen regarded the colonies as useless and expensive encumbrances, and their efforts are now directed towards strengthening the bond of union between them and us. The enthusiastic manner in which all the colonies have offered, and almost demanded, to take a share in the recent war, speaks well for the future. If the Empire makes as much advance in the century before us as it did during the last, the year 2000 will see such an empire in existence as was never dreamed of by statesmen.

The following books may be consulted for fuller information:—*Australasia*, by A. W. Jose (J. M. Dent); *The Story of Australia*, by F. Shaw (H. Chapman); *Oceana*, by J. A. Froude (Longmans); *Greater Britain*, by Sir Charles W. Dilke; *The Miner's Right*, by Rolf Boldrewood; *Fifty Years in the Making of Australian History*, by Sir H. Parkes. The handbooks, etc., issued gratis by the agents-general of the various states contain exhaustive information on all points.

PRACTICAL ELEMENTARY SCIENCE.

AN EXPERIMENTAL COURSE COVERING THE REQUIREMENTS OF BOTH THE DAY AND EVENING SCHOOL CODES IN PHYSICS AND CHEMISTRY.*

BY THOMAS CARTWRIGHT, B.A., B.SC.

The Burning of Chalk.—The pupil has already learned that chalk is changed by heat into an entirely new substance. This experiment may be carried further by performing it quantitatively, if the teacher desires it. All that is needed is a crucible and a balance, and means for strongly heating the chalk, so as to completely change the whole of it by submitting it to the action of heat. Some powdered chalk—whiting does very well for the purpose—is placed in the crucible, the weight of which has been previously ascertained, and is then again weighed; the gain in weight being, of course, the chalk upon which the experiment is to be made. The crucible is now placed in a muffle furnace, if one is available; or it is heated by means of a foot blowpipe, or, failing this, by being placed for about half an hour in a clear fire, care being naturally taken to see that none of the chalk is lost when the crucible is placed in and removed from the fire. If several experiments are allowed to go on simultaneously, opportunity will present itself for emulation in manipulation, each boy striving to obtain the most accurate result. The homely experiment is always the most suitable in school work, and there is no reason why the result should be less trustworthy when the fire is utilised instead of the more expensive and elaborate muffle furnace or foot blowpipe, if pains are taken to see that none of the contents of the crucible are lost, and that nothing is added either by dropping into the crucible or by adhering to the outside thereof. The heating at an end, it remains to reweigh the crucible, and to calculate how much per cent. has been lost by the chalk in the process of heating. This should be 44, if the substance were pure and the heating complete; so that 100 pounds of chalk, marble, or limestone should theoretically yield 56 pounds of lime.

Action of Acids.—Nothing is more interesting or more conspicuous than the action of acids on chalk, marble, limestone, and kindred bodies; and it is the easiest thing in the world for boys to study: hence a successful lesson can always be anticipated in this part of the work. Test-tubes, or, failing these, the small narrow bottles used by chemists, should be served out, and small pieces (or powder) of chalk, marble, and limestone should be also given to each child, whose task it is to put a portion of each separately in the test-tube or bottle, and to pour thereon vinegar, spirits of salt (hydrochloric acid), and vitriol (sulphuric acid)—making in all nine simple experiments, the aim of which is to ascertain exactly what takes place. Another test-tube or small phial containing lime-water should now be served out to each pupil, and the experiments, wholly or partly, should be again performed, with this addition, namely, that while the fizzing, or effervescence, is going on, the test-tube should be tilted in such wise as to have the mouth of it touching the mouth of the test-tube containing the lime-water, so that the two are as nearly as possible at right angles to each other, without permitting any of the acid to flow from the tube containing the marble into that containing the lime-water. This latter is now shaken up, whereupon the pupils should be asked to explain what has happened; the teacher's aim being to get them to see that an invisible something (therefore a gas) has been separated from the chalk by the acid, and has passed into the lime-water, which it has turned milky. This invisible gas is chalk gas, and it is the escape of this when acid is poured on chalk, marble, or limestone that causes the effervescence.

Chalk Gas Evolved from Heated Chalk.—The teacher will perhaps do best in making this a lecture, and not a class, experiment. A hard glass test-tube is to be fitted with a cork carrying a delivery-tube that passes under the surface of some lime-water contained in a second test-tube. In the hard glass test-tube is placed a little powdered chalk, marble, or limestone, and the test-tube is then subjected to as great an amount of heat as possible. One way of working the experiment is to place the end of the hard glass test-tube in a fire, as was done with the crucible; but this is by no means necessary, as the heat of a Bunsen burner will suffice to decompose sufficient of the substance to make the lime-water milky, and so to establish the fact that the same gas is got from chalk by the action of heat as by the action of acids.

Chalk Gas in Bulk.—The best way to get the gas in bulk is to act upon pieces of chalk or marble, about the size of nuts, with hydrochloric acid. Sulphuric acid is not so suitable, because the body that results is insoluble in water, and is therefore not so easily cleared out of the generator. The apparatus usually employed is a Woulffe's bottle, which is used because it is strong, and is provided with two necks; but an ordinary flask, or indeed any glass bottle, will do equally well, so that the only expense incurred in providing every pupil with a chalk-gas apparatus is the cost of the glass tubing and the thistle-funnels, which are to be used as follows:—The cork of the bottle is provided with two

* Books referred to in this series of articles are published by T. Nelson and Sons.

holes. Through one of these passes the thistle-funnel, the end of which must be nearly at the bottom of the bottle, so that it may be well below the surface of the acid (the pupils should be required to state why this is necessary). An L-shaped piece of glass tubing passes first through the other cork, so that its end is as near the top of the bottle as possible (here again the pupil should be required to state why). To this L-shaped exit-tube is fastened by means of indiarubber tubing another L-piece, sufficiently long to pass nearly to the bottom of the gas jar or bottle that is to act as receiver. Further economy in this apparatus may be effected by dispensing with the thistle-funnel and providing the cork with only one hole. When all is ready, the acid is poured down the thistle-funnel, or, removing the cork, direct into the bottle when no thistle-funnel is used, and at once the gas begins to come off, and will collect in the dry gas jar or bottle, of which mention has already been made. A burning taper is plunged into a jar of the acid, the pupils being required to record what happens, and to compare it with what took place when a burning taper was immersed in the jar of hydrogen. Lime-water is poured into a second jarful of the gas, and what takes place after the lime-water has been shaken up, the hand in the meantime having been held closely over the mouth of the jar, is also recorded. A third jarful is poured into a jar or bottle containing some more lime-water. How may we tell whether or no the gas has passed into the lime-water bottle? What may we infer as to the character of the gas from the fact that it can be thus poured out like water? How was hydrogen poured out? What has this to do with the way in which we collected the gas—namely, by allowing it to fall into the receiving-jar? What became of the air that was in this jar before the chalk gas began to collect therein? These are some of the questions that may be appropriately put at this juncture. The delivery-tube is now placed in a bottle containing some blue litmus solution, the colour of which is to be very carefully noted before any of the gas passes into it, and also after the gas has passed into it for some time. It will be advisable to make this clear by having a comparison jar filled with the unchanged litmus solution in juxtaposition with the jar containing the litmus solution that has been acted upon by the chalk gas. Moreover, a very weak solution of acid may be poured into a third solution of blue litmus to help the pupils to the conclusion that the chalk gas when added to the water gives it an acid reaction. The fact that the gas is a non-supporter of combustion may be further strikingly proved by pouring a gas-jar full of it upon a lighted candle or other flame. The extinction of the flame will fix itself on the mind more firmly than that of the taper when immersed in the gas; and the same experiment also affords additional evidence of the fact, already demonstrated, that the gas is heavier than air. Other experiments bearing upon the same property are—(1) to counterpoise a beaker and then to pour some of the gas into the beaker, which will bump down, and so clearly show that the gas is heavier than air; (2) to blow soap bubbles and allow them to float on the surface of the gas contained in a beaker or other suitable vessel.

Analysis and Synthesis.—The precipitate obtained by passing the chalk gas into lime-water for a considerable time should be collected by filtration, and after having been dried, should be tested with acid in order to show that it is the same chalk with which we started. It should then be easily evident to the children that chalk has been built up from lime and chalk gas; and pains should be taken to lead the class up to the statement of the fact that this operation is the exact converse of what takes place when chalk is heated as in the limekiln, and as in the fire experiment. This should be recorded in the laboratory books as follows:—

Limestone, chalk, and **marble** } (when heated) yield **lime** and **chalk gas.**

Chalk gas and **lime** (lime-water) } form **chalk.**

The fact that chemistry treats of the building up and breaking up of compounds in order to find out their properties should also be insisted upon in connection with this part of the work.

What Chalk Gas is.—This may best be shown by preparing some oxygen—which will form an excellent excuse for a revision of the lesson on this gas—and burning some charcoal in it by putting a few pieces of the size of a nut in a deflagrating spoon, and by holding this in a Bunsen flame until it begins to glow, and then transferring it to a jar full of oxygen. After the burning is over, lime-water should be poured in and be shaken up, when the characteristic milkiness betokening the presence of chalk gas will appear. It should be easy now to get the pupils to state that chalk gas is carbon oxide, and they may be told that its proper chemical name is **carbon dioxide,** or, less accurately, carbonic acid. The teacher may take this opportunity of showing the distinction (and the relation) that exists between an anhydride and its acid, when it will be seen why the term "acid" is inapplicable to an oxide; but the matter is not fundamental, and may be omitted, except in the case of forward pupils.

Carbon Dioxide from other Bodies.—Different substances should be burned over lime-water by various pupils, in order to show that when bodies containing carbon burn in air or in oxygen, carbon dioxide is produced. An opportunity will again present itself for the display of a little ingenuity, and the same experiment may well be done in various ways. For example, a candle may be placed in a jar or bottle over the mouth of which a glass plate is placed, and the lime-water may be subsequently poured in by raising the plate. Or the lime-water may be first of all placed in the jar or bottle, and the candle, fixed to a piece of wire doubled over, so as to place the candle just over the surface of the water, may be set burning for a considerable time, after which the lime-water should be shaken up. Coal gas may be burned over lime-water by fixing a piece of glass tubing, bent over in a semicircle at the end by means of rubber tubing, to the gas supply. In these, and in as many other ways as may suggest themselves, such bodies as a candle, coal gas, petroleum, methylated spirit, rags, etc., should be burned, to show that when they burn carbon dioxide is formed, the test of such products being always the lime-water.

Application to Ourselves.—Lastly should come the well-known experiment of breathing in lime-water and an explanation of the *rationale* thereof. The difficulty will be to show that we are composed of carbon amongst other things, and the easiest suggestion of this will be the charring of a piece of meat and a question as to what the black substance is that remains over as a result of this charring. If necessary, the charred meat may be burned in oxygen or in air, and the lime-water test may be applied to the products of this combustion. There will, of course, be a difficulty in understanding *how* this carbon that is part of our composition is burned up; but beyond the statement that the supply of oxygen is provided by the inspiration of the air by the lungs, which also by expiration throw off the chief part of the carbon dioxide produced, the teacher need not go.

Carbon Dioxide and the Air.—It will be seen that so much burning of carbon, even if the burning of coal and the expiration of all living creatures is alone taken into consideration, must result in vast quantities of the gas being let loose into the atmosphere. It will also be seen that as burning cannot go on in chalk gas, so also life processes, which have been shown to be a kind of slow burning, are also rendered impossible by the presence of this gas in the air. How is it, then, that the atmosphere does not become unfit for breathing, as it does in a room with no outlet for the carbon dioxide expired from the lungs of the people therein? A simple experiment will answer the question. Into a beaker, or other glass vessel, containing water carbon dioxide is passed, until the water is saturated therewith. Beneath the surface of this water a sprig of freshly-gathered water-cress or other weed is put, over which is placed an inverted funnel, the stem of which passes under a test-tube filled with the water saturated with carbon dioxide. This may be effected by placing the stem of the funnel in the test-tube whilst both are under the water, and then raising both until they are vertical. The arrangement thus made is to be left exposed to the light for several days, during which time it is to be examined, in order to see if any bubbles

of gas come off, and collect in the test-tube by displacing the water contained therein. If sufficient bubbles collect for the purpose, the gas is to be examined with a smouldering chip, in order to show that it is oxygen; if not, then the pupils must be told that it *is* oxygen, and further, that the oxygen comes from the break-up of the carbon dioxide, which decomposition has been effected by the green colouring matter of the plant in conjunction with the light. That the light is necessary to the reaction may be shown by placing a similar apparatus in darkness, and observing that under these altered conditions there is no evolution of gas. It is not possible to show further than has been done that the oxygen comes from the break-up of the carbon dioxide by the action of the green colouring matter of the plants; hence this should be stated as a fact. When it is known that this action goes on universally, it will be seen that there is a kind of balancing going on by the action of living beings in polluting the air with the carbon dioxide that is expired by them, and by the action of plants in breaking up this deleterious matter into life-preserving oxygen and into carbon, which the plants themselves use to build up their manifold tissues. Whence it arises that the quantity of carbon dioxide in the open air does not vary to any great extent, the amount being about 4 parts in 10,000 parts, or ·04 per cent.

Carbon Dioxide and Fermentation.—Into a flask or bottle, fitted with a delivery-tube that passes below the surface of some lime-water held in a test-tube or a phial, are placed a solution of grape sugar in warm water and a small piece of yeast. After having been left for a time, the solution will be seen to be giving off a gas, as is evinced by the bubbles that freely escape from the surface; further, it will be seen that this gas is carbon dioxide, for the lime-water turns unmistakably milky. This process, due to the growth of the yeast (which is a minute plant of the fungus kind), is an exceedingly common one in nature, and it is always accompanied by the evolution of carbon dioxide.

Bread-making.—The commonest applications of fermentation are in brewing and in baking, and it should be pointed out that the escape of the bubbles of carbon dioxide during the setting of the dough brings about the porosity of the bread, to which are due its lightness and digestibility. Furthermore, the making of the crust of pies by the agency of baking-powder is also accompanied by the evolution of carbon dioxide, since baking-powders are always composed of substances that when heated give off carbon dioxide. (See Cartwright's *Domestic Science*, p. 93.)

Dangers of Carbon Dioxide.—The gas having no smell, does not warn us of its presence, except by its pernicious effects upon the system. As it is so heavy, it lies low down in places where it is present at all. Hence we read of places like the cave at Pozzuoli, near Naples, and at Death's Gulch in the Yellowstone Park, Wyoming, U.S.A., where animals and even men have been poisoned by coming into a carbon dioxide laden atmosphere. Wells are very often rendered dangerous of descent by the presence of the gas, and the precaution of sending down a candle is one that should never be neglected if a descent is to be effected in safety. It will not be difficult for the class to see that where a candle cannot burn a man cannot live; and if the contrary is the case, it only shows the need for again going over that part of the lesson that has dealt with respiration.

Choke-Damp.—Reference should also be made to this substance, and if it is stated that it is produced by the burning of an inflammable gas that lurks in mines, and which is known as **fire-damp**, the way will have been made clear for another experiment in proof of this fact. This is nothing other than the repetition of the burning of coal gas, which contains a considerable proportion of the fire-damp, over carbon dioxide. Or the fire-damp itself may be made, if preferred, by slaking some lime with a strong solution of caustic soda, and by mixing this, when dry, with sodium acetate, after which the mixture is placed in a retort and heated, the retort being provided with a delivery-tube for the collection of the gas over water, as in the case of oxygen and hydrogen. (See "*Section Two*" *Physiography*.) A jar of the gas is provided with a glass plate, which is placed over the mouth after the gas has been burned, and which is slipped aside to pour in some lime-water, whereby is established the fact that the choke-damp which comes from the burning of the fire-damp is heavily charged with the deadly carbon dioxide.

OUR ILLUSTRATED GEOGRAPHICAL NOTEBOOK.

THE COMMERCIAL RELATIONS OF FRANCE AND THE UNITED KINGDOM.

DURING recent years splenetic outbursts against "perfidious Albion" on the part of the Anglophobe press of Paris have to some persons seemed but the heralds of impending international disasters. The prospects of an invasion of Great Britain have been seriously discussed, and the relative chances of the forces of each power calculated to a nicety. But against the usually trivial reasons for war, there is commonly left out of the calculation the overwhelming reason for peace which exists in the ever-increasing intercommercial relations of the two countries.

The total value of the trade between France and the United Kingdom last year was over £68,000,000, and of this £47,000,000 consisted of French exports to Britain, the balance representing British goods entering France.

We thus see that Britain is not only an excellent customer, but on going deeper into the annual returns, we find that she is the best customer that France has on her books, as is clearly shown by the following table and diagram:—

THE CHIEF CUSTOMERS OF FRANCE.

Country.	Value of total Commerce between France and her best four Customers.		—
	French Exports to (*a*).	French Exports from (*a*).	Total Trade.
(*a*).	(*b*).	(*c*).	(*d*).
United Kingdom.....	47,224,960	21,257,280	68,482,240
Belgium	22,214,880	12,426,880	34,641,760
Germany	17,137,600	13,785,640	30,923,240
United States.....	9,451,800	15,989,360	25,441,160
Russia	2,900,000	6,700,000	9,600,000

The trade of the United Kingdom with France is considerably more than that of the next best two countries combined. Russia is not fifth in order of value, and is included only to emphasise the fact that whatever value France may attach to an alliance with Russia, commercial interests do not lie in that direction.

The total foreign trade of France (excluding colonial trade) in 1899 was £324,211,680, to which Britain contributed £68,482,240, or more than one-fifth of the whole.

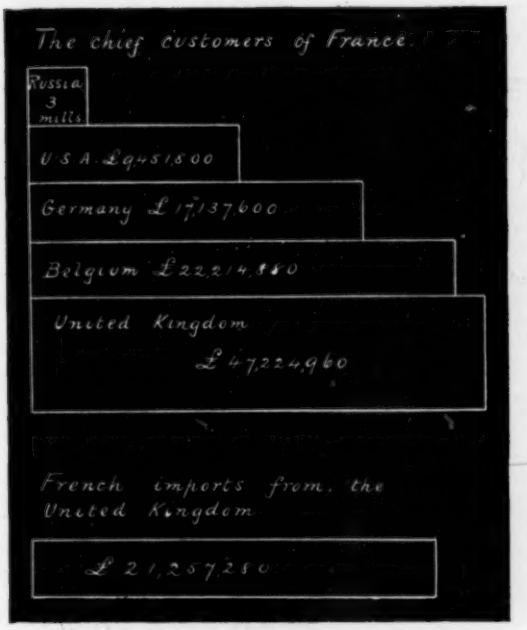
From the colonial experiences of France, it is evident that her best interests lie in the exploitation of her own great natural wealth. Her population is almost, if not quite, stationary; and she has no need to seek vast areas, as in the case of Britain, in which to find homes for her ever-increasing millions of people. The commercial instinct is strong in France, and to be a nation of shopkeepers is no longer considered to be a reproach. This being so, the vast commercial interests of France will weigh heavily in the councils of the nation, and such sources of prosperity will not lightly be endangered for any such unimportant reason as the possession of some outpost of civilisation in the Soudan or elsewhere.

There is no reason for an irresponsible section of the French press to seek imaginary and sentimental grievances as an excuse for abusing the best commercial friend their nation possesses, but there are very solid reasons for the cultivation of a better knowledge of each other, for therein lie not only the commercial interests of both peoples, but also the possible safeguarding of the peace of Europe.

Foreign Eggs.

Though our cheap loaf depends upon the supply of wheat

from abroad, there is no reason beyond rural supineness why the cheap egg should not be an entirely native product. Last year we imported no less than 2,025,820,000 eggs. Five and a half millions sterling paid to the foreigner, which



might have gone into the pocket of the British farmer! Of this sum Russia took £1,109,000; Germany, £1,016,000; Denmark, £923,000; France, £868,000; Belgium, £733,453; and other countries three-quarters of a million between them.

The growth of the egg trade has been a steadily increasing one. The imports into the United Kingdom have been:—

Year.	No.	Value.
1860	167,695,000.	£550,000.
1870	430,842,000.	1,102,000.
1880	747,408,000.	2,235,000.
1890	1,234,949,000.	3,428,000.
1900	2,025,820,000.	5,500,000.

And still the imports progress by leaps and bounds. In January last the eggs imported numbered four and a half millions more than in the corresponding month of the previous year.

These figures ought to convince the British farmer that there still remains one profitable antidote to agricultural depression if he will but make the best of his opportunities.

In 1897 France was first, whereas she is now a bad fourth. Denmark is but a small country, with but few initial advantages, and her hold on our egg trade is almost entirely the result of organised method in the manner of collecting the eggs for market.

Previous to 1895 Denmark had scarcely entered our markets, but that year saw the establishment of six co-operative egg societies—a system that had already been applied to the export of butter with very satisfactory results.

The country in which the members of a society live is divided up into districts with a convenient collecting centre, usually a railway station. Every producer brands his eggs with a distinctive number, and the agent in charge refuses to accept any eggs more than four days old. In this manner a high standard is established, which creates a continuous and ever-increasing demand. In 1900 there were 837 egg societies, with 130,000 members, and the net result was that Denmark was able to supply the United Kingdom alone with 300,000,000 of eggs.

Denmark is but little more than twice the area of Yorkshire, and is not its equal in population by at least a million; and its climate is far more extreme than our own. The farms of the United Kingdom possess almost ideal conditions for successful fowl-rearing and the production of eggs. What we do not possess, however, is "system." Foreign competition presses hard upon us in many quarters, and we are unable to shake off our competitors; but in the egg trade there is not the slightest reason why the whole of the money now sent abroad might not be kept within our own borders.

The Wastage of Merchant Tonnage.

The annual wastage of merchant tonnage is enormous. A recent return issued by *Lloyd's Register of British and Foreign Shipping* shows that in 1899 the mercantile fleets of the world lost 996 vessels of 783,508 tons, of which one-third were steamers. These figures exclude vessels of less than 100 tons.

Stranding appears to be the most potent factor in removing vessels from the active list—39 per cent. of the steamers, and 44 per cent. of the sailers; collision accounts for the loss of 12 per cent.; and 11 per cent. appear under the unsatisfactory and ominous heading "Missing."

The merchant navies of the world which possess more than a million tons are:—

1. United Kingdom.
2. British colonies and dependencies.
3. United States.
4. Germany.
5. France.
6. Norway.

Our percentage of loss of vessels owned is 2·59; Germany, 2·8; and Norway, 5·9. In this last the figures are no reflection on the seafaring capabilities of the Norwegians, but a striking indictment of their propensity for purchasing obsolete tonnage removed from under the British flag owing to the high standard of efficiency demanded by vigilant authorities.

Our loss of steam tonnage alone is 2·24 per cent., against 2·68 for the other countries; our sailers show a loss of 3·75 per cent., against 5·88 per cent. It will be readily seen that a multiplication of steam tonnage is synonymous with increased safety of life and property. It is a matter for congratulation that while the merchant shipping under the British flag is equal to the combined mercantile navies of the world, it enjoys a greater immunity from disaster than any other.

"Comrades All" is the title of the first number of the *Annuaire de la Correspondance Interscolaire*; or, as the German title given, *Internationaler Schülerbriefwechsel*—an annual intended for the use of modern language students in the interests of international correspondence. It is divided into three sections—namely, English, French, and German—and edited by Mr. W. P. Stead, Professor Mieille, and Dr. Hartmann. The annual contains a complete account of the correspondence between scholars and between teachers, a scheme about which we have so often written in our columns. In addition to this, there are some amusing and interesting contributions by well-known writers, and by scholars; a good number of letters actually written by either teachers or scholars; and the fullest information in relation to the rules to be observed with respect to this excellent scheme, which has proved so successful as an aid to the acquirement of foreign languages. The plan adopted in the French and German sections is similar to that of the English section, and the whole letterpress of the three languages is brightened by the inclusion of a number of pleasing illustrations. As already stated, this first number appears as an annual; but we feel, and no doubt the editors are of the same opinion, that to be of real practical value to student and teacher, a number should be published either at quarterly or monthly intervals. For the latter a large circulation would, of course, be necessary; but we have no doubt Mr. Stead would be quite equal to the enterprise if adequately encouraged by his readers. Many additional features might be included if in the form of a monthly magazine, and possibly it might be thought desirable to incorporate contributions in both Italian and Spanish, and so make it a thoroughly practical and indispensable modern language monthly. For the present, however, we invite our readers to see the annual and examine it for themselves; and to this end they should send stamps to the value of one shilling to the *Review of Reviews* office, Mowbray House, Norfolk Street, London, W.C.

KINDERGARTEN GIFTS AND OCCUPATIONS IN AN ELEMENTARY SCHOOL.

BY A PRACTICAL TEACHER OF INFANTS.

III.

Scheme of Work for the Autumn Term, 1901.

Story.	Nature or Object Lesson.	Song, Game, or Recitation.	Kindergarten Occupations.
The Fantail Pigeon. Nero at the Bakery (*Child's World*).	The Cornfield. Cutting the Corn. How Wheat Becomes Flour. A Wind-mill and a Water-mill. The Baker. How Bread is Made. The Dairy. How Butter is Made.	**Games and Songs—** The Gleaners (*Tinnemore*). The Water-mill (*Michaelis*). The Reapers (*Original*). Little Bakers (*Original*). Little Dairymaids (*Original*). **Recitations—** The Wind-mill. Corn and Bread (*Miss Warrington*). Making Bread. Making Butter (*Miss Poulsson*).	**Brush-work.** — Wheat, oats, barley, moon-daisies. **Clay Modelling.**—A rolling-pin, a loaf, biscuits, pats of butter, a peel, a skimmer. **Drawing.**—A sickle, a churn, a wind-mill, a mill-wheel, pans for cream. **Paper Folding.**—The baker's cap and apron, the bakehouse. **Gifts III. and IV.**—An oven, the kneading trough. **Paper Cutting and Mounting.**—A wind-mill.
Apple-Seed John. The Chestnut Boys. Mr. Chipmunk (*Child's World*).	Autumn Fruits. Apples and Pears. Stone Fruits. Nuts and Acorns. Autumn Berries. The Squirrel. Mushrooms. Poisonous Berries.	**Game—** The Squirrel (*E. Poulsson*). **Song and Game—** Autumn (*Original*). **Recitations—** The Two Squirrels. A Calendar of the Year, verses 9, 10, and 11 (*Miss Pickering*).	**Brush-work.**—Hips, haws, mountain-ash sprays, blackberries, squirrels. **Clay Modelling.**—Nuts, acorns, mushrooms, apples, pears. **Drawing.**—Oak leaves, chestnut leaves, clusters of nuts, mushrooms, basket for nuts. **Paper Cutting and Mounting.**—An apple and leaf, a pear and leaf. **Stick-laying.**—Trees, gates.
Baby Bud's Winter Clothes. The Crane Express. What the Wind Did. The Rainbow (*Child's World*). The Brownies. The Idle Wind. The Little Stream. The Fairy Sunshine (*Fables for Little Folk*).	Signs of Autumn. The Fall of the Leaf and Its Work. Migration. Migratory Birds. The Sun and Its Work. The Wind and Its Work. The Rain and Its Work. The Frost and Its Work. How Plants Store up Food. Seeds. Dispersion of Seeds.	**Games—** The Swallows (*Madame Michaelis*). Autumn, from *The Seasons* (*Michaelis*). The Wind. The Raindrops (*Original*). **Songs—** O Rain! where have you come from? (*Saltaire*). Above the Spire (*A. S. Gatty*). **Recitations—** How the Leaves Came Down (*Source unknown*). The Sunbeam. The Wild Flower's Complaint. The Raindrops (*Miss Pickering*).	**Brush-work.**—Oak and chestnut leaves, swallows (outline), a seascape showing flight of swallows, a rainbow. **Clay Modelling.**—Swallow's nest, poppy capsules and other seed-vessels. **Drawing.**—Seed-vessels, roots and stems that are food reserves. **Paper Cutting and Mounting.**—A swallow, autumn leaves. Special nature walks to gather leaves, and preserve them for nature work during the winter. Mount them on cards after pressing them.

Scheme of Work for the Winter Term, 1901-2.

Story.	Nature or Object Lesson.	Song, Game, or Recitation.	Kindergarten Occupations.
The Thrifty Squirrels. Jack Frost and His Work. The Birds' Christmas. Christmas in the Barn. The Fairy's New-Year Gift (*Child's World*).	Winter Time. Snow and Ice. Snow-clad Lands. The Laplander. Evergreen Trees. A Winter Walk. The Robin. The Sparrow. The Blackbird. Animals that Sleep in Winter. Christmas.	**Games—** Running, marching, and ring games. The Laplander (imitation). The Sparrows (*Miss Poulsson*). **Songs—** Robin Red. The Snow Man (*A. S. Gatty*). **Recitations—** On the Ice. Snowflakes (*Miss Warrington*). The Flowers' Lament (*Miss Pickering*).	**Brush-work.**—Spray of yew and fir; holly, ivy, laurel, and mistletoe leaves; a sledge, canoe, and snow-shoe in outline work. **Drawing.**—A robin, a sparrow, a blackbird, a Christmas stocking, oranges, nuts, Christmas toys. **Clay Modelling.**—An orange, a Brazil nut, a walnut, a chestnut; the Laplander's canoe, sledge, and snow-shoes. **Paper Cutting and Mounting.**—A robin, a sparrow, an ivy leaf.

Story.	Nature or Object Lesson.	Song, Game, or Recitation.	Kindergarten Occupations.
A Visit to the Weaver. John's Trousers. Cotton-Field Stories. How a Little Boy Got a New Shirt. Goody Two Shoes. The Cobbler and the Children (*Child's World*).	Clothing. Cotton. The Weaver. Wool. The Sheep. Silk. The Silkworm. Leather. The Shoemaker. A Straw Hat.	**Games—** Imitation Games. Sheep-shearing, Wool-winding, Cotton-picking, Weaving, Shoemaking. The Cobbler. The Game of Trades. **Songs—** The Caterpillar (*E. Poulsson*). The Lambs (*E. Poulsson*). **Recitations—** The Silkworm. The Flax Flower (*adapted from Child's World*).	**Brush-work.**—The cotton plant, the flax plant, a silkworm, a mulberry leaf. **Clay Modelling.**—A straw hat, a cap, a shoe, an awl, a last, the tub for soaking the leather, the hammer. **Drawing.**—A stocking, a boot, a muff, a glove. **Mat Weaving.**—Simple patterns to imitate the weaver. **Simple Straw Plaiting.**—Imitation work.
The Story of Mrs. Speckle. The Lost Chicken. The Story the Milk Told Me. The Cow that Lost Her Tail (*Child's World*).	Food. The Tea Plant. The Cocoa Tree. The Coffee Tree. Rice. An Egg and Fowls. Milk and the Cow. Vegetable Foods. Animal Foods.	**Games—** Hen and Chickens (*Saltaire*). Imitation Games in connection with tea, coffee, and cocoa. **Songs—** The Cow (*R. L. Stevenson*). The Hen and Chickens (*E. Poulsson*). **Recitations—** The Market (*Songs and Games for the Kindergarten*). The Cow (*Chambers*).	**Brush-work.**—The tea plant, a cocoa pod, cocoa and coffee beans, etc. **Clay Modelling.**—An egg, a fowls' house, a milk pail, a milking stool, various vegetables. **Drawing.**—A teapot, a milk jug, a sugar basin, a fowl's head, a cream pan, a ladle. **Paper Cutting and Mounting.**—A fowl's egg.

HISTORY UNDER THE PRESENT CODE.

SCHEME FOR STANDARD III.

(*Combining Instruction in History, Geography, and Recitation.*)

In formulating schemes of instruction, whether inclusive of history or not, it is as well to keep in view the requirements of previous Codes. To lose sight of them is to build a structure of (we will say) geography on very doubtful foundations. Previous knowledge of the subject on the children's part will be very variable unless some definite course of instruction has previously been followed. In combining history and geography lessons, therefore, it will be found safer to follow previous Code arrangements in geography, and adapt history lessons to them. Some deviations will be found necessary, however.

In Standard III. the combination of the two subjects presents no difficulty, and one subject naturally illustrates the other. The geography lessons describe the stage on which the actors—the heroes and heroines of the history stories—make their appearance.

The following course is a suggestive example:—

(*a*) The physical **geography** of England and Wales.

(*b*) Lessons on "England before the Norman Conquest."

1. **The Story of the Ancient Britons.**—Condition of the country at that time: forests, marshes, waste lands, no roads, no towns. Description of Anglesea, Stonehenge, etc., in connection with Druidical worship.

2. **The Story of the Romans.** Their action on the country as road-makers. Trace the course of the chief Roman roads and Roman walls. Places of interest connected with the Roman occupation: Dover, Bath, Chester, etc.

3. **The Story of the Tribes from beyond the North Sea.**—Their descent on the east coast. Rough division of the land between the conquerors and conquered—the former seizing the productive east and midland portions, the latter being driven into the mountains and rugged ground of Wales and Cornwall.

4. **The Chief Facts connected with the Life of Alfred the Great.**—Descriptions of places of interest in connection—that is, Athelney, Wantage, etc. (Special interest attaches to this reign during the present year.)

Suitable **recitation** selections in illustration of these lessons may be found in Cowper's poem "Boadicea," or in "Caractacus," by B. Barton.

SCHEME FOR STANDARD IV.

(*Combining Instruction in History, Reading, and Recitation.*)

The method of combining history lessons with the ordinary Code work in geography of Standard IV. produces a somewhat discursive and uninteresting course. It will be found better in this case to **substitute** history for part of the geography, and to take—

1. The present-day geography of Scotland and Ireland.

2. The "England of the Norman and Plantagenet times."

Thus 2 will serve instead of further geographical lessons on England and Wales, and will develop the idea of history already worked out to the date of the Norman Conquest in Standard III.

A very complete idea of England at the period mentioned is obtained by treating the lives of ten or twelve typical men. Thus the story of Hereward as a typical Saxon, rebelling against the Norman aggression, gives an idea of the feeling of the Saxon nobles against their conquerors, and the failure of their efforts. The story of Becket as a typical churchman tells of the immense power which the church became during the period. The stories here suggested will be found to cover most classes of society and most conditions of life in England under the Normans and Plantagenets.

The Stories of—	*Class Represented.*	*Facts in Connection.*
William.	The Norman conquerors.	Norman authority.
Hereward the Wake.	The Saxon conquered.	Saxon defiance.
Thomas à Becket.	Priest.	Power of the Church.
Simon de Montfort.	Baron.	Origin of Parliament.
Robin Hood.	Outlaw.	Insecurity of life and property.
The Black Prince.	Soldier.	Extension of English power in France.
Wat Tyler.	Peasant, agitator.	Condition of the peasantry.
Geoffrey Chaucer.	Poet.	Growth of the language.
William Caxton.	...	Invention of printing.
Wallace. Joan of Arc.	...	Connection of England with Scotland and France.

Reading may be very satisfactorily combined with this course of lessons, but in all cases it should supplement and illustrate the history, and in nowise attempt to teach the subject. Longfellow's poem "The Norman Baron" is very suitable as a *recitation* in connection with this course of lessons.

AN INFANT SCHOOL TIME TABLE.

MORNING.

	Stand. or Class.	9 to 9.30.	9.30 to 10.	10 to 10.30.	10.30 to 10.45.	10.45 to 11.15.	11.15 to 11.35.	11.35 to 12.
MONDAY.	Stand. I. Class I. Class II.	Bible Stories. ,,	A Story. ,, ,,	Reading. ,, ,,	RECREATION.	B.B. Drawing. Writing. ,,	Swedish Drill. ,, Number.	Arithmetic. ,, K.-G. Games.
		9 to 9.30.	9.30 to 9.50. | Singing. | to 10.	10 to 10.30.		10.45 to 11.10.	11.10 to 11.30. | Singing. | to 11.40	11.40 to 12.
	Class III. Class IV.	Hymns. ,,	A Story. ,,	Games. ,,		Sounds. Gift III.	Recitation. Clay Modelling.	Gift III. Number Play.
TUESDAY.		9 to 9.30.	9.30 to 10.	10 to 10.30.		10.45 to 11.15.	11.15 to 11.35.	11.35 to 12.
	Stand. I. Class I. Class II.	Hymns. ,, ,,	Nature Lesson. ,, ,,	Reading. ,, ,,		Writing. B.B. Drawing. Writing.	Kindergarten Games. ,, Number.	Arithmetic. ,, Singing.
		9 to 9.30.	9.30 to 9.50. | Singing. | to 10.	10 to 10.30.		10.45 to 11.10.	11.10 to 11.30. | Singing. | to 11.40	11.40 to 12.
	Class III. Class IV.	Texts. ,,	Nature or Object Lesson. ,,	Games. ,,		Sounds. Stick Laying.	Recitation. Nursery Rhymes	Stick Laying. Ninepins.
WEDNESDAY.		9 to 9.30.	9.30 to 10.	10 to 10.30.		10.45 to 11.15.	11.15 to 11.35.	11.35 to 12.
	Stand. I. Class I. Class II.	Bible Stories. ,,	{ History or Geography. Nature Lesson. ,,	Reading. ,, ,,		Writing. ,, B.B. Drawing.	Dumb-bell Drill. ,, Number.	Arithmetic. ,, Drill.
		9 to 9.30.	9.30 to 9.50. | Singing. | to 10.	10 to 10.30.		10.45 to 11.10.	11.10 to 11.30. | Recitation | to 11.40	11.40 to 12.
	Class III. Class IV.	Hymns. ,,	Picture Lesson. ,,	Games. ,,		Sounds. Gift III.	Singing. Clay Modelling.	Gift III. Shell Laying.
THURSDAY.		9 to 9.30.	9.30 to 10.	10 to 10.30.		10.45 to 11.15.	11.15 to 11.35.	11.35 to 12.
	Stand. I. Class I. Class II.	Scripture Repetition. ,,	Nature Lesson. ,, ,,	Reading. ,, ,,		B.B. Drawing. Writing. ,,	Kindergarten Games. ,, Number.	Arithmetic. ,, Singing.
		9 to 9.30.	9.30 to 9.50. | Singing. | to 10.	10 to 10.30.		10.45 to 11.10.	11.10 to 11.30. | Singing. | to 11.40	11.40 to 12.
	Class III. Class IV.	Texts. ,,	Nature or Object Lesson. ,,	Games. ,,		Sounds. Stick Laying.	Recitation. Nursery Rhymes	Stick Laying. Ninepins.
FRIDAY.		9 to 9.30.	9.30 to 10.	10 to 10.30.		10.45 to 11.15.	11.15 to 11.35.	11.35 to 12.
	Stand. I. Class I. Class II.	Bible Stories. ,,	{ History or Geography. Nature Lesson. ,,	Reading. ,, ,,		Writing. B.B. Drawing. Writing.	Swedish Drill. ,, Number.	Arithmetic. ,, K.-G. Games.
		9 to 9.30.	9.30 to 9.50. | Singing. | to 10.	10 to 10.30.		10.45 to 11.10.	11.10 to 11.30. | Recitation | to 11.40	11.40 to 12.
	Class III. Class IV.	Hymns. ,,	Picture Lesson. ,,	Games. ,,		Sounds. Gift III.	Singing. Clay Modelling.	Ninepins. Shell Laying.

AFTERNOON.

	Stand. or Class.	2 to 2.30.		2.30 to 3.	3 to 3.10.	3.10 to 3.40.		3.40 to 4.
MONDAY.	Stand. I. Class I. Class II.	Boys, Drawing. Girls, Needlework. ,, Drawing. ,,		Writing. Recitation. Conver. Lesson.	RECREATION.	Kindergarten Occupations. Blackboard Drawing. Kindergarten Occupations.		Singing. ,, Recitation.
		2 to 2.30.	2.30 to 2.50.	2.50 to 3.		3.10 to 3.30.	3.30 to 3.50.	3.50 to 4.
	Class III. Class IV.	Sand Drawing. ,,	Gift I. or II. Gift I.	Finger Plays. ,,		Kindergarten Colouring.	Occupations. Ravelling.	Closing Hymn and Prayer.
TUESDAY.		2 to 2.30.		2.30 to 3.		3.10 to 3.40.		3.40 to 4.
	Stand. I. Class I. Class II.	Boys, Drawing. Girls, Needlework. ,, Printing Sounds. ,,		{ Tonic Sol Fa or Recitation. Writing. A Story.		Kindergarten Occupations. ,, ,,		Singing. ,, Recitation.
		2 to 2.30.	2.30 to 2.50.	2.50 to 3.		3.10 to 3.30.	3.30 to 3.50.	3.50 to 4.
	Class III. Class IV.	Sand Drawing. ,,	Building. Gift I. or II.	Finger Plays. ,,		Kindergarten Sorting Colours.	Occupations. Beads.	Closing Hymn and Prayer.
WEDNESDAY.		2 to 2.30.		2.30 to 3.		3.10 to 3.40.		3.40 to 4.
	Stand. I. Class I. Class II.	Boys, Drawing. Girls, Needlework. ,, Drawing. ,,		Word Building. ,, Conver. Lesson.		Kindergarten Occupations. ,, ,,		Recitation. Tonic Sol Fa. ,,
		2 to 2.30.	2.30 to 2.50.	2.50 to 3.		3.10 to 3.30.	3.30 to 3.50.	3.50 to 4.
	Class III. Class IV.	Sand Drawing. ,,	Conversational Lesson. Gift I.	Finger Plays. ,,		Kindergarten Colouring.	Occupations. Ravelling.	Closing Hymn and Prayer.
THURSDAY.		2 to 2.30.		2.30 to 3.		3.10 to 3.40.		3.40 to 4.
	Stand. I. Class I. Class II.	Boys, Drawing. Girls, Needlework. ,, Printing Sounds. ,,		Writing. Recitation. A Story.		Kindergarten Occupations. ,, ,,		Singing. ,, Recitation.
		2 to 2.30.	2.30 to 2.50.	2.50 to 3.		3.10 to 3.30.	3.30 to 3.50.	3.50 to 4.
	Class III. Class IV.	Sand Drawing. ,,	Gift I. or II. ,,	Finger Plays. ,,		Kindergarten Sorting Colours.	Occupations. Beads.	Closing Hymn and Prayer.
FRIDAY.		2 to 2.30.		2.30 to 3.		3.10 to 3.40.		3.40 to 4.
	Stand. I. Class I. Class II.	Boys, Drawing. Girls, Needlework. ,, Blackboard Drawing. ,,		{ Tonic Sol Fa or Recitation. Writing. Conver. Lesson.		Blackboard Drawing. Kindergarten Occupations. ,,		Singing. ,, ,,
		2 to 2.30.	2.30 to 2.50.	2.50 to 3.		3.10 to 3.30.	3.30 to 3.50.	3.50 to 4.
	Class III. Class IV.	Sand Drawing. ,,	Building. Gift I.	Finger Plays. ,,		Kindergarten Colouring.	Occupations. Dolls.	Closing Hymn and Prayer.

OUR TUTORIAL SECTION

OUR PUPIL TEACHERS' AND SCHOLARSHIP COURSE.

BY ARTHUR T. FLUX,

Principal of the Belvedere Pupil Teachers' Centre, First on Scholarship List; Author of "Scholarship School Management," "Building of the British Empire," etc.

SPRING EXAMINATION, 1902.

Second Month—May.

WORK TO BE PREPARED.

1. READING AND RECITATION.

SEE remarks made on these subjects last month. Guard against thinking them of little importance. Reading orally well is an accomplishment which few people possess.

2. ENGLISH.

Candidates.—Gray's *Elegy*, verses 5-8. Learn the derivations of all important words—prefixes and suffixes. Analyse the whole, and parse any words presenting difficulties.

First Year.—Cowper's *Task*, Book V. ("The Winter Morning Walk"), lines 1-40, with derivations of important words.

Second Year.—*Paradise Lost*, Book III., lines 56-134, with derivations, etc.

3. COMPOSITION.

Write one or two essays each week from the list in *The Pupil Teacher's English Notebook*. Take great care with this subject.

4. HISTORY.

Candidates.—The Norman kings—Henry II., Richard, and John.

First Year.—Henry I., Stephen, and Henry II.

Second Year.—The Civil War and the Commonwealth.

5. GEOGRAPHY.

Candidates.—England: climate, natural productions, industries, imports and exports.

First Year.—France and Germany.

Second Year.—Africa (excluding British possessions).

6. ARITHMETIC.

Candidates.—G.C.M. and L.C.M.

First Year.—Percentages.

Second Year.—Discount.

7. ALGEBRA AND EUCLID.

First Year.—Euclid: Props. 1-4. Algebra: subtraction.

Second Year.—Euclid: Props. 30-34, with four deductions per week. Algebra: continued practice in factors.

8. MUSIC.

Candidates.—Standard scale of pitch; mental effects, and how modified.

First Year.—Continued practice in transition.

Second Year.—Names of chromatic notes.

Notes on the Work for the Month.

The reading book for second year pupil teachers has been changed to one of the Waverley Novels, or one of Macaulay's *Essays*. Students are advised to get *Old Mortality* (Messrs. A. and C. Black), specially prepared for pupil teachers.

1. ENGLISH.

Gray's *Elegy*. *General Paraphrase (continued)*, verses 4-8:—

Their life's work is over, and nothing can arouse them from their lowly bed. The bright morning, with the perfume of flowers in its breath, the song and chirping of the nesting birds, the crowing of the cock, and the horn of the huntsman have no longer any voice for them. No more is the bright fire prepared; no more does the careful wife prepare the evening meal; no more do the children crowd round their father on his return, eager to get the loving kiss of greeting.

Yet during their life they did their work well. Many a time has the golden harvest fallen beneath their sickle, has the land been turned up in brown furrows, has the great tree fallen beneath their conquering axe; and all their labour was performed with cheerfulness and zest. Their work was of a humble character, their joys were simple, their lives were totally unknown to fame; and yet they should not be despised by the ambitious man, nor should the rich man think the record of their lives a subject for amused contempt.

It must be remembered that Gray wrote these lines at a time when the labouring classes of England were in a wretchedly poor condition, and when they were regarded by the depraved moneyed classes as little better than, if as good as, the beasts in the fields. Cowper raised his voice on their behalf; so did Goldsmith, who expressed the same ideas as above when he said,—

"Should the philosophic mind disdain
That good which makes each humbler bosom vain?
Let school-taught pride dissemble all it can,
These little things *are* great to little man."

Notes on Parsing and Analysis.

Verse 5. *Call, swallow, clarion, horn.* Subjects of *shall rouse.*
Twittering. Imperfect participle, qualifying *swallow.*
Echoing. Adjective, qualifying *horn.*
(Beginners often find a difficulty in distinguishing between the imperfect participle and the adjective when they are of the same form. If the word is used immediately before the noun, it is an adjective; if used after, and especially if there are words dependent on it, it is the participle—for example, "the singing bird" and "the bird singing on the tree." In the first case, "singing" is an adjective; in the second, a participle. The change of position often entails a change in meaning—for example, "a dining room" and "a room dining," "a walking stick" and "a stick walking," etc.)
No. Adverb of negation, limiting *more.*
More. Adverb of time, modifying *shall rouse.*
6. Supply *shall* before *ply, run, climb.*
To lisp, to share. Infinitives of purpose.
7. *Did.* Not an auxiliary of emphasis in this case; used to make a form of the past tense to suit the metre.
Broke. The form of the past tense used for the participle *broken.*
How. Expletive adverb, modifying *jocund.*
Afield. Adverb: *a* in this case = *in* or *on*—compare *ashore, afloat, abed.*

First Year.

The poem set for study has been changed to Cowper's *Task*, Book V., lines 1-362. Special and full notes will appear in next and succeeding issues.

Second Year.

MILTON'S "PARADISE LOST," BOOK III.

Read up very carefully lines 96-134. The doctrine of free will therein contained is very important. There is a special note in the text-book on the point.

2. COMPOSITION.

Send up an essay occasionally for criticism. Read up any subject with which you are not quite familiar. It takes years of practice to be able to write fluently and easily.

3. HISTORY.

Candidates.—The chief points to which you must direct your attention are:—

1. The Conquest of England, which was not completed for some years.
2. The Feudal System—most important.
3. The Domesday Book, Curfew bell, etc.
4. The changes resulting from the Conquest.
5. The Investiture Dispute.
6. Henry's Charter.
7. Robert of Normandy and the Crusades.
8. The Civil War between Stephen and Matilda.
9. Henry's quarrel with Becket: causes and results.
10. Henry's reforms.
11. The Conquest of Ireland.
12. Richard's share in the Crusades, and the state of England in his absence.
13. John's quarrel with the Pope; loss of the French provinces.
14. Events leading up to, and the provisions of, the Magna Charta.

First Year.—As above, in greater detail.

Second Year.—Prepare a table of the various battles fought, the results, and the leaders on each side. Draw a map, and put in names of all places mentioned. Understand clearly Self-denying Ordinance, Pride's Purge, National Covenant (1638), Solemn League and Covenant (1643), Instrument of Government, Humble Petition and Advice, etc. How do you account for Cromwell's success? Note the interval between the surrender of Charles and the second Civil War, and also that it was not by the wish of the Parliament as a whole or of the nation that Charles was beheaded, but by the action of a small party of Independents backed by the army.

The reduction of Scotland and Ireland must be mastered.

The chief feature of Cromwell's government was his spirited foreign policy—his determination to make the name of Englishmen feared abroad as at home.

Note capture of Jamaica, treaty with France, defence of the Albigenses, compensation exacted from the Pope and from the Dutch, and the destruction of the pirates in Tunis.

Cromwell retained his position entirely by military force and unusual ability, and hence, when he died, the whole fabric of republican government tumbled to pieces.

4. Geography.

Use notebooks and maps, and tabulate wherever possible.

Candidates.—In preparing the industries, note any reasons why they should be found in any particular district—for example, Why should the cotton manufacture flourish in Lancashire and not in Kent? Arrange notes as follows—industries, places engaged, ports for import and export of raw materials; and so deal with agriculture, dairy-farming, mining, manufactures (cotton, silk, wool, hardware, porcelain, chemicals, etc.), shipbuilding, fishing, etc.

First Year.—Note the governments of France and Germany—the latter especially.

See that you can answer such questions as:—

1. What do you know of the industries of France (or Germany), and the towns engaged?
2. What are the chief ports of France, and with what countries do they particularly trade?
3. Describe the country and people of that part of France drained by the Rhone.
4. What do you know of the Landes, Auvergne, Rheims, Marseilles, etc.?
5. What is meant by Baltic trade?
6. What do you know of the Zollverein, Free Cities, Hartz, Black Country of Germany, Black Forest?
7. Describe, with a sketch-map, the course of the Rhine.

Second Year.—Note particularly the partition of Africa amongst the European powers; British occupation of Egypt; Algeria; the Soudan—its people, industries, and towns.

5. Arithmetic.

Candidates.—What is a measure, a common measure, the greatest common measure, a multiple? Which is the better term—G.C.M. or H.C.F. (highest common factor)? Note the principles on which the G.C.M. is founded—"If a number measures two others, it measures their sum, their difference, or the sum or difference of any multiples." This is expressed algebraically as—If a measures p and q, it measures $mp + nq$.

See that you know how to find the G.C.M. or L.C.M. of 3 or more numbers.

Note that—

$$\text{G.C.M. of fractions} = \frac{\text{G.C.M. of numerators}}{\text{L.C.M. of denominators}}.$$

$$\text{L.C.M. of fractions} = \frac{\text{L.C.M. of numerators}}{\text{G.C.M. of denominators}}.$$

The following are typical questions:—

Of how many numbers is 400 a multiple?

If a man had 1328 oranges and 1400 lemons, into how many boxes could he put them, having an equal number of each, and keeping the fruits separate?

(The G.C.M. = 8—that is, 8 oranges or 8 lemons. To find the number of boxes, divide the numbers by 8 and add the quotients.)

What is the least number which will divide by 8, 12, 14, 16, and leave a remainder of 3? (Find L.C.M. and add 3.)

What is the least number that, divided by 24, leaves 21; by 36, leaves 33; by 48, leaves 45?

(In this question the remainder is in each case 3 less than the divisor. Hence find L.C.M. and deduct 3.)

The G.C.M. of two numbers consists of the factors 5, 9, 7, and one of them contains in addition 13, and the other 17. Find the numbers.

(The G.C.M. must occur in each, therefore the numbers are $5 \times 9 \times 7 \times 13$ and $5 \times 9 \times 7 \times 17$.)

First Year.

Percentages.—Remember always to base calculations on 100, or to take 100 as cost price. For example: A sells a horse to B for 20 per cent. gain, and B to C for 20 per cent. gain. What is total gain per cent. and the cost price if it is sold for £72?

The total gain per cent. is *not* 40. Say A buys for 100 and sells for 120, B buys for 120 and sells for 120 + 20 % of 120 = 144. ∴ total gain = 44.

Then state—Cost price of 144 = 100.

$$\text{Cost price of } 1 = \frac{100}{144}.$$

$$\text{Cost price of } 72 = \frac{100}{144} \times 72 = £50.$$

There is a splendid collection of examples in the text-book recommended.

Second Year.

Discount is interest on present worth. Note banker's discount, which is merely simple interest. The following are typical sums:—

Find the discount on £151, 17s. 6d., due 4½ years hence, at 4½ per cent. simple interest.

Reason thus:—£100 invested for 4½ years at 4½ per cent. amounts to £120.

Then—Discount on £120 = £20.

Discount on £1 = $\frac{1}{6}$.

$$\text{Discount on £151, 17s. 6d.} = \frac{£151,\ 17s.\ 6d.}{6} = £25,\ 6s.\ 3d.$$

A bill of £375 is drawn on March 6 at 6 months, and discounted on June 26 at 5 per cent. What is the amount paid?

Six months from March 6 = September 6.

Bill is discounted June 26. ∴ discount is reckoned for the time from June 26 to September 6 = 73 days.

Then—Interest on 100 at 5 % for 73 days = £1.

Then—Amount paid on 101 = 100.

$$\text{Amount paid on } 1 = \frac{100}{101}.$$

$$\text{Amount paid on } 375 = \frac{100 \times 375}{101}.$$

6. Algebra.

Second Year.—Great care should be taken with the factors. All the examples in Hall and Knight should be carefully studied and worked.

Test Questions.

1. *English.—Candidates.*
   (*a*) Analyse verse 2, and parse *air* (6), *save where* (7), *does* (10), *such as* (11), *each* (15).
   (*b*) Say what you can of the metre of the poem.

   First Year.
   Analyse lines 1–10, and parse *more ardent as, most* (5), *ineffectual* (7).

   Second Year.
   (*a*) Analyse lines 21 ("Thee I revisit safe") to 32 ("nightly I visit"), and parse *but* (4), *rather* (7), *hard* (21), *to wander* (27), *so much the rather* (51).
   (*b*) Give a short account of the cosmography as depicted to Milton.
2. *Penmanship.*
   Write, as specimens of copy-setting:—
   Large Hand—*Unrivalled.*
   Small Hand—*Hail, holy light! offspring of heaven first-born.*
3. *History.—Candidates.*
   (*a*) Say what you can of Alfred's life and work.
   (*b*) Who were Dunstan, Godwin, Guthrum, Boadicea?

   First Year.
   (*a*) Point out the chief results of the Norman Conquest.
   (*b*) Give a short account of the reign of William II.

   Second Year.
   (*a*) Say what you can of James I. and his parliaments.
   (*b*) Trace the growth of Puritanism in England.
4. *Geography.—Candidates.*
   (*a*) Describe as fully as you can the physical features of the country south of the Thames.
   (*b*) What do you know of the Fens, the Downs, Forest of Dean, the Broads, the Peak.

   First Year.
   (*a*) Describe, with a sketch-map, the mountain system of Europe.
   (*b*) Say what you can of the vegetable productions of the south of Europe.

   Second Year.
   (*a*) Describe, with a sketch-map, the mountain system of Africa.
   (*b*) The rivers of Africa are not well suited for navigation on account of sand-bars, cataracts, etc. Justify this statement.
5. *Arithmetic.—Candidates.*
   (*a*) Divide 30000 by 9375 by the factors 5, 5, 5, 3, 5, 5, and find the real value of the remainder.
   Ans. 1875.
   (*b*) A number is divided by the factors 7, 8, and 9, and the remainders are 5, 4, and 7. What would the remainders be if the factors had been used in the order 8, 7, 9? Ans. 1, 4, 7.
   (*c*) Multiply 3546 by 729819 in three lines.

   First Year.
   (*a*) What capital would produce £84, 7s. 5½d. interest in 2 years 5 months at 3½ per cent.?
   Ans. £997, 10s.
   (*b*) In what time will £436, 10s. amount to £558, 18·1s. at 7 per cent.? Ans. 4½.
   (*c*) At what rate per cent. does the simple interest on £372, 10s. for 18 years amount to £301, 14s. 6d.?
   Ans. 4½ per cent.
   (*d*) In what time will £1, 7s. $6\frac{3}{4}\frac{4}{5}\frac{3}{2}$d. double itself at 5 per cent. simple interest? Ans. 20 years.

   Second Year.
   (*a*) Find the compound interest on £1200 for 3 years at 4 per cent. Ans. £149, 16s. 8·832d.
   (*b*) What principal will amount to £42,908·1696 in 8 years at 20 per cent. compound interest?
   Ans. £10,000.

AUTUMN EXAMINATION, 1901.

Seventh Month.

Work to be Prepared.

1. Reading and Recitation.

These subjects must not be neglected. Regular oral practice is always essential.

2. English.

Candidates.—*Marmion*, Canto vi., lines 681–797.
First Year.—*The Traveller*, lines 297–334. Twenty roots and meanings each week. Derivation of all important words in the passage set for preparation.
Second Year.—*Julius Cæsar*, Act iii., Scene 3, to Act iv., Scene 3, line 120—"and leave you so."

3. Essays.

Write one or two essays each week, selecting from the following:—*Description of any Ruin; Wages—why some Men receive more than others; The Habits and Mode of Life of any Wild Animal; The Coast of England; Difficulties a Pupil Teacher meets with; The Changes brought about by the Norman Conquest; Football; Your Favourite Recreation.*

4. History.

Candidates.—James I. to the Restoration.
First Year.—The Wars of the Roses to 1485.
Second Year.—George I. and George II. (See *Notes* below.)

5. Geography.

Candidates.—The physical features, climate, and productions of Scotland.
First Year.—Siberia, China, Japan, and the Malay Peninsula.
Second Year.—The United States and Central America.

6. Arithmetic.

Candidates.—Problems in fractions and decimals.
First Year.—Percentages.
Second Year.—Square and cube root.

7. Euclid.

First Year.—Props. 21–24, and four deductions per week.
Second Year.—Revise Props. 7–12, with eight deductions each week.

8. Algebra.

First Year.—G.C.M. and L.C.M.
Second Year.—Quadratic equations.

9. Music.

Work a set of questions weekly, and take regular exercise in practical work.

Notes on the Month's Work.

1. English.

Pay particular attention to composition. Reading good books, and continual practice, are the only means by which the subject can be improved. Send up an essay occasionally for criticism. Above all, do not neglect essay writing.

2. History.

Candidates.—The Stuart period is one in which the great struggle for supremacy between King and Parliament came to a head. It is very necessary, therefore, for the candidate to trace very carefully the gradual growth in the power of the Commons from 1265. Note also the impetus which the Reformation gave to the movement. As men had thrown off the domination of the Pope in spiritual affairs, so they (Presbyterians and Independents) endeavoured to curb the power of the Crown. The chief points to be noticed are:—
James the First. The various plots against him. The Hampton Court Conference, and the Authorised Version of the Bible. The rise in power of the Puritans. The quarrels with Parliament.
Charles the First had more determination than his father. The three parliaments, and the Petition of Right. Eleven years of absolute rule, during which period money was raised illegally. The ill-advised attempt to force a liturgy on the Scottish Church led to the calling of the Long Parliament and a demand for money. Note Hampden's objection to pay *ship-money*—not because of the amount, nor because it was a war tax levied in time of peace, but because it was *illegal*. Prepare a table of the battles in the Civil War, the names of commanders, and the result. Draw a map of England, and put in the various places where battles were fought.
The Commonwealth. Cromwell's personality preserved this form of government. His spirited foreign policy raised England to a foremost position among the nations of Europe. When he died, there was no one to hold the power and control the army; hence Charles the Second was invited to return. It must also be remembered that, although the majority of Englishmen wished for a juster form of government than that of Charles the First, only a part of them fought against him, and only a small section of those (the Independents) were responsible for his execution.
First Year.—The various battles, leaders, and results should be tabulated and learned. The results of this contest are very important: (*a*) the Feudal System was practically destroyed; (*b*) the king was left nearly absolute, for the Commons were not yet strong enough to oppose him effectively; (*c*) a new era commenced, in which diplomacy took the place of physical force. A life of Warwick should be learned.
Second Year.—George the First. Whig party in power. The Riot Act. The Rebellion of 1715, and consequent passing of the Septennial Act, lengthening the duration of Parliament from three to seven years. The South Sea Bubble, and Walpole's remedies. Wood's Halfpence, and the *Drapier Letters*. Note that the South Sea Company was by no means an impossible venture. The utter failure was due (1) to paying the government too high a price for the concession of the monopoly of trade; (2) to raising more capital than there was any prospect of paying interest on; and (3) to lavish waste of money and very bad management.
George the Second. Walpole's administration—peace and prosperity. His Excise scheme. War with Spain. The Pragmatic Sanction, and the War of the Austrian Succession. The Rebellion of 1745—an attempt on the part of the French to complicate matters for us at home, and so prevent any spirited action against them on the Continent. Reform of the calendar. The Seven Years' War. Affairs in India: Clive at Plassey, Eyre Coote at Wandewash. Affairs in America: Wolfe and the capture of Quebec. 1759 is spoken of as the "most glorious year that England has ever seen." Why? Prepare a list of victories. The results of this war were vast: our Indian Empire was founded, and Canada passed from the hands of France—the earliest colonisers—to England.

3. Geography.

Candidates.—Draw maps of the outline till thoroughly known. Continual repetition is the only way to impress facts and places on the memory.
First Year.—Note Russian extension of recent years in Turkestan and the Pamirs, the Trans-Siberian Railway, Russian policy in China. China is now absorbing much attention, and should receive special notice. Japan forms a striking contrast to China, having adopted Western ideas with great success.

The Trans-Siberian Railway.

Russia has always experienced a difficulty in its commerce by not having a port on one of the great oceans. The ports on the Arctic are frozen for a large part of the year, those on the Baltic can only be reached through the narrow Sound, and those on the Black Sea could easily be blocked from Constantinople. Notwithstanding continual effort, the empire has not yet reached the Persian Gulf, and it is only in the extreme east of Siberia that an absolutely open port can be obtained. But a port there could only be useful if connected with Moscow and St. Petersburg by rail. Hence the project of the Trans-Siberian Railway, which was commenced in 1891, to connect Vladivostock with the Russo-Siberian frontier.
Starting from St. Petersburg, the route is through Moscow, Ufa, Omsk, Tomsk, Krasnoiarsk, Irkutsk, to Baranchiki, on Lake Baikal (3,830 miles). At Baranchiki the train is taken on board a specially constructed steamer, the *Baikal*, made in England, and put together on the shores of the lake. It is constructed to carry three trains at once—a passenger train in the centre, and a goods train on either side. It is fitted with a powerful screw at the bow which will break through two or three feet of ice. Trains will be conveyed across the lake to Misovaya, a distance of forty-three miles, and from that place they will resume their land journey to Stretensk, on the river Shilka. Steamers will then convey both goods and passengers down to Khabaroffka, on the Amur. A line is already working between this place and Vladivostock (500 miles).
An extension will probably be made to Port Arthur and Talienwan.
The line has cost Russia many millions sterling, and it is doubtful whether it will be a financial success. The rails are light, and are merely spiked instead of being bolted; the embankments are frequently made of sand, which blows away in a heavy wind; and "trains run off the line like squirrels." The rate is only about fourteen miles per hour. Unless a heavy charge is made for passengers, it will not pay; and if a heavy charge is made, very few will travel. Tea and silk are perhaps the only commodities that would pay their way for transit from east to west.
That it will assist in the development of Siberia is certain, and that it will be used for military purposes in the Far East is also certain.
Second Year.—The United States is set for special study, and hence requires particular attention. Sketch-maps must be drawn and learned. The ordinary text-book can be supplemented by geographical readers on the States. Prepare answers to the following questions (write if there is any difficulty):—
1. Describe, with a sketch-map, the river system.
2. Draw a map to illustrate the main lines of railways.
3. What are the chief imports and exports, and from what ports do they come and go?
4. What is a state? a territory? What is meant by the "District of Columbia"?
5. Give a complete account of the United States government.
6. Make a list of the twenty chief towns, and mention any reasons why some of them have increased rapidly in size.
7. What is a "blizzard"? How do you account for the sudden and destructive storms which occur?
8. What and where are the Yellowstone National Park, Alkali Plains, Salt Lake, Bluegrass State, Yosemite Valley, Golden Gates, levees?
9. Give a description of a visit to New York.
10. What is meant by the "Monroe Doctrine"? What are the foreign possessions of the United States?

4. Arithmetic.

Candidates.—Any good text-book will supply a suitable selection of problems on fractions.
The problems set in the examination require careful thought, and demand some intelligence in solution. A favourite form of question is: "If a man gives away $\frac{1}{3}$ of his money, then $\frac{2}{3}$ of the remainder, then $\frac{1}{4}$ of what then remains, and has 15s. left, what had he at first?"
These sums may be worked in two ways:—
(*a*) Let his original amount be 1.
1. If he gives away $\frac{1}{3}$, he has $\frac{2}{3}$ left.
2. He then gives away $\frac{2}{3}$ of $\frac{2}{3}$, and has $\frac{1}{3}$ of $\frac{2}{3}$, or $\frac{1}{3}$, left.
3. He then gives away $\frac{1}{4}$ of $\frac{1}{3}$, and has $\frac{3}{4}$ of $\frac{1}{3}$, or $\frac{3}{12}$, left.

$\frac{3}{12}$ of the money = 15s.
$\frac{1}{12}$ of the money = 5s.
$\frac{12}{12}$ of the money = 80s.

Or (*b*), working backwards from the result,—
1. 15s. is $\frac{3}{4}$ of the last amount; ∴ the total was 20s.
2. 20s. is $\frac{2}{3}$ of the next amount; ∴ the total was 60s.
3. 60s. is $\frac{3}{4}$ of the original amount; ∴ the total was 80s.

The latter method is preferable where anything beyond fractions is introduced. For example: A woman gave away $\frac{1}{3}$ of a number of eggs *and 1*, then $\frac{1}{4}$ of the remainder, then $\frac{1}{5}$ of what then remained, and had 15 left; how many had she at first?
Reasoning backwards,—
1. She had 15 left after giving away $\frac{1}{5}$; ∴ she had 30 before.
2. 30 remained after giving away $\frac{1}{4}$; ∴ 30 = $\frac{3}{4}$ of second number, which = 45.
3. 45 is $\frac{2}{3}$ of the original number all but one.
∴ 46 is $\frac{2}{3}$ of the original number, which is 69.

First Year.—Sums dealing with percentage must in all cases be stated and worked by method of unity. In nearly all cases the cost price should be taken as 100. In a case like the following, "A sells a horse to gain 20 per cent. to B, B sells to C to gain 25 per cent., C sells to D for £82, 10s. and gains 10 per cent.; what did the horse cost A?" it is wrong to say the total gain is 55 per cent.

Let cost price to A = £100. Then he sells to B for £120; B sells for £120 + 25 per cent. of £120 = £150 (not £140); C sells for £150 + 10 per cent. of £150 = £165. Then state thus:—

Original cost of $165 = 100$.

" " $1 = \frac{100}{165}$.

" " £82, 10s. $= \frac{100 \times £82, 10s.}{165} = £50$.

If any sum is met with which cannot be worked, it should be sent up for solution.

5. Algebra.

The G.C.M. and L.C.M. must be worked by *factors*.

6. Teaching.

All pupil teachers should take regular practice in writing on a blackboard, as prescribed in the syllabus. (Use *Practical Teacher Copy Book* for models.)

Test Questions.

1. *Penmanship.*
   Large Hand:—*Undenominational.*
   Small Hand:—*We are such stuff as dreams are made of.*
2. *English.—Candidates.*
   Analyse the following, and parse the words in italics:—
   "'Stint in thy prate,' quoth Blount, '*thou'dst best*,
   And listen to our lord's *behest*.'
   And *not* a *moment* will he *bide*
   Till squire or groom before him *ride*."

   First Year.
   Paraphrase lines 255–266, *The Traveller*.
   Analyse lines 277–280.
   Parse:—"Till, seeming blest, they grow to what they seem."

   Second Year.
   Paraphrase:—"Good friends, sweet friends.....
   .....to rise and mutiny."
   Analyse:—"I am no orator.....
   .....which you yourselves do know."
   Parse:—"And none so poor to do him reverence."
3. *History.—Candidates.*
   (*a*) By what means did Henry the Seventh raise money?
   (*b*) Say what you can of the Reformation in England.
   (*c*) Write a life of Mary Queen of Scots.

   First Year.
   (*a*) What revolts were there in Henry the Fourth's reign?
   (*b*) Give an account of Henry the Fifth's campaign in France.
   (*c*) How do you account for the loss of the French provinces in the reign of Henry the Sixth?

   Second Year.
   (*a*) What was the main object of William the Third's foreign policy?
   (*b*) Give the causes and results of the War of the Spanish Succession.
   (*c*) Say what you can of the social life in the reign of Queen Anne.
4. *Geography—Candidates.*
   (*a*) Give as full an account as you can of the physical features of Wales. Draw a sketch-map to illustrate them.
   (*b*) What do you know of Cardiff, Penryn, Lake Bala, Welshpool, Llandaff, and Anglesey?

   First Year.
   (*a*) Describe, with a sketch-map, the mountain system of Asia.
   (*b*) Give an account of the chief vegetable productions of (1) Siberia, (2) India.

   Second Year.
   (*a*) Describe a journey by the Canadian Pacific Railway.
   (*b*) What do you understand by the term "Dominion of Canada"? How is the Dominion governed? Give a complete list of the provinces and territories, with their chief towns.

SCHOLARSHIP EXAMINATION, 1901.

Fifth Month.

Work to be Prepared.

1. *Reading and Repetition.*—Ten minutes' practice daily, and as much general reading as possible.

2. *Penmanship.*—Regular practice from *The Practical Teacher Copy Book.*

3. *Theory of Teaching.*—Chap. v., *Scholarship School Management.*

4. *Geography.*
   (*a*) New Zealand.
   (*b*) Revise Asia Minor, Persia, Arabia, Afghanistan, Beluchistan, and the Central States.

5. *English.*
   (*a*) Grammar and syntax of the adverb.
   (*b*) Twenty-five roots and meanings each week.
   (*c*) Elizabethan writers.
   (*d*) *Julius Cæsar*, Act iii., as far as Brutus's speech in the Forum.

6. *History.*—The Tudors.

7. *Composition.*—One or two essays each week, on such subjects as:—The History of Australia; "There's a divinity that shapes our ends, rough-hew them how we will;" "A great victory is more popular than peace;" Emigration; Holland and the Dutch; "Every dark cloud has a silver lining;" Warwick the "King-maker;" The Importance of Cleanliness.

8. *Arithmetic.*—Proportion—simple and compound; division in proportional parts; and partnership.

9. *Algebra.*—Quadratics.

10. *Euclid.*—Revise Book I., Props. 1–10, and ten deductions per week.

11. *Elementary Science.*—The chemistry of carbon, iron, mercury, water, carbon dioxide, lime, silica, common salt, iron oxide, and mercuric oxide.

12. *Languages.*
    Latin—Pars. v. and vi. of *Life of Epaminondas*. Revise adjectives.
    French—Four chapters from *Le Roi des Montagnes* or other French reader.

13. *Drawing.*—A freehand copy each week.

14. *Music.*—Chap. v., *School Music Teacher.*

15. *Domestic Economy.*—Preparation of food for eating.

Notes on the Work for the Month.

1. *Reading, Repetition, and Penmanship.*—These subjects must not be neglected. They deserve continual attention, for they are in the majority of cases *weak* subjects.

2. *Geography.*—Copy the following notes into notebook and commit to memory:—

New Zealand.—Area, 104,471 square miles; population, 703,360 Europeans and 39,854 Maoris.

Physical Features.—Draw a map, and insert all details to be learned. Special points:—Alpine scenery of South Island. The wonder district of North Island—geysers, hot springs, volcanoes, etc. The famous Pink and White Terraces, formed of deposits of silica, destroyed in June 1886 by an eruption of Mount Tarawera. Hot springs of great medicinal value. (Read the description of this district in Froude's *Oceana*.)

Climate.—Temperate—slightly warmer than England. Average temperature—spring, 55°; summer, 63°; autumn, 57°; winter, 48°. Abundant rain owing to sea on all sides and transverse mountain ranges. Suitable for raising everything that grows in Temperate Zone.

Productions.—Vegetable:—
(*a*) Native—Kauri pine and its resin; kauri gum.
Native flax (*Phormium tenax*).
Cedars, birches, ironwood, etc.
Tree ferns.
(*b*) Introduced—Timber and fruit trees, grasses, cereals, oats, wheat, barley, potatoes.

Animal:—
(*a*) Native—Practically none: a small rat, a dog, and pigs (probably introduced by Captain Cook).
(*b*) Imported—Horses, 270,000; cattle, 1,250,000; sheep, 20,000,000; poultry, game, salmon, trout.

Mineral:—Gold, silver, iron, copper, lead, zinc, and coal.

Industries.—Agriculture, dairy-farming, sheep-farming, and stock-raising; flax-spinning, fruit-growing, and lumbering.

Exports.—Beef (fresh), butter, cheese, kauri gum, mutton, rabbits, skins and hides, tallow, wool. (Meat, etc., exported in frozen condition—Canterbury lamb sold largely in England. Butter also frozen.)

Imports.—Apparel, cotton goods, leather, iron and steel, machinery, spirits, woollens.

Natives.—Maoris—a fine race, probably from Samoa; at one time cannibals. Good-looking, honest; living on reservations, and being killed by kindness. (Read up in *Oceana*.)

Towns.—Wellington, Auckland, Dunedin, Christchurch, Invercargill, Napier, Nelson, Oamaru.

Government.—(*a*) A Governor—Earl of Ranfurly.
(*b*) Legislative Council of forty-five, appointed for seven years.
(*c*) House of Representatives—seventy-four, elected for three years (four Maori members).

Distance from London, 16,000 miles; transit, thirty-eight days.

3. *English.*—Learn a good classification of the adverb. Note from what class of words they are formed; also the comparison of adverbs. Be particularly careful about the syntax—some adverbs *qualify*, others *limit*, etc.

Notes:—
(1.) *Whether, whence, wherein, whereby, wherefrom*, etc. Relative adverbs (*whence = from where, wherein = in which*).
(2.) *Yes* and *no* are really not adverbs, but *word sentences*. For example: Did you go? *No*. The word *no* does not modify anything; it is equivalent to a whole sentence—I did not go.

(3.) *Adverbial object.* Go *home;* the river is *sixty feet* wide, etc.
(4.) *There* is often used as an introductory word, when the verb precedes the subject, without any suggestion of place—for example, *There* are some people, etc.
(5.) *The* is an adverb in such phrases as—*The* more *the* merrier.
(6.) The adverb modifies a phrase or a sentence—for example, *Close* by the river's brink, *just* as the sun was setting, etc.

Elizabethan literature is a wide subject, on which the student can only be expected to get general ideas. The following are points to be noted :—

(1.) The extraordinary outburst which followed the Revival of Learning. "England became a nest of singing birds."
(2.) The popularity of the drama, consequent on the discontinuance of the old miracle play.
(3.) The variety of the subjects treated, and the virility of the style of most writers.
(4.) The Euphuists (so named after *Euphues*, by John Lyly), who adopted a fantastic style of speech, and used as many classical words as possible; satirised by Scott in Sir Piercie Shafton in *The Monastery*.
(5.) The following writers deserve notice :—
  (*a*) Shakespeare.—The Bard of Avon, the world's greatest dramatist.
  (*b*) Marlowe —Second only to Shakespeare.
  (*c*) Sidney.—*Arcadia*, the first prose romance.
  (*d*) Spenser.—*The Faerie Queen, Shepherds' Calendar*, etc.
  (*e*) Raleigh.—Poems, *History of the World*.
  (*f*) Hooker.—*Ecclesiastical Polity;* founder of English prose.
  (*g*) More.—*Utopia*, a sketch of a model commonwealth.
  (*h*) Lyly.—*Euphues*.
  (*i*) Ben Jonson.—Dramatist.

4. *History.*—Be prepared to answer a question on any of the following points :—

Henry VII.
  (*a*) Causes of the high prerogative exercised by the Tudors.
  (*b*) Yorkist risings.
  (*c*) Home government. Suspension of parliamentary life; extended use of the Star Chamber. Accumulation of money by subsidies, by confiscation and fines after revolt, by benevolences, by exactions for breaches of obsolete laws.
  (*d*) Foreign policy and marriage schemes. The marriage of Henry led eventually to the Reformation, and of Margaret to the accession of the Stuarts.

Henry VIII.
  (*a*) Foreign wars—With France (Holy League against France): Field of Cloth of Gold.
  (*b*) Home affairs. Power in Wolsey's hands; no parliament for eight years. Visitation of monasteries in 1524; suppression of forty small ones.
  (*c*) The question of the divorce, and consequent fall of Wolsey.
  (*d*) Royal supremacy over the church established; but Henry was *not* a reformer.
  (*e*) Suppression of monasteries, 1536-39. Pilgrimage of Grace. Note the use the monasteries had been to the poor, and trace the results of suppression—riots, distress (tilled lands turned into sheep farms), various Acts against vagrants, and finally the Poor Laws of Elizabeth.
  (*f*) Henry's wives.
  (*g*) Lives of the chief men.

Edward VI.
  (*a*) Introduction of the Protestant religion. Chief points in which the reformed religion differed from the old religion :—
    (i.) English substituted for Latin in the services.
    (ii.) Rejection of the worship of the Virgin and saints, and abolition of masses for the dead.
    (iii.) Sacrament of both kinds administered.
    (iv.) Disuse of auricular confession.
    (v.) Rejection of the doctrine of transubstantiation.
    (vi.) Clergy no longer condemned to celibacy.
  (*b*) *Somerset's Protectorate.* Invasion of Scotland, and Battle of Pinkie. Vagrant Act. Act of Uniformity. Fall of the Protector.
  (*c*) *Supremacy of Warwick.*

Mary.
  (*a*) Lady Jane Grey's temporary sovereignty.
  (*b*) Restoration of the Roman Catholic religion.
  (*c*) Marriage with Philip of Spain. Wyatt's rebellion. Execution of Lady Jane Grey.
  (*d*) The Marian persecution.
  (*e*) The war with France, and loss of Calais.

Elizabeth.
  (*a*) *Difficulties* at commencement of reign.
    (i.) *At home.*—General social discontent. Impoverished treasury. No army, no navy; trade stagnant. Bitter feelings between Catholics and Protestants.
    (ii.) *Abroad.*—Hostility of France, Spain, and the Pope.
  (*b*) Re-establishment of the Protestant religion. Acts of Uniformity and Supremacy.
  (*c*) Difficulties with Scotland and Mary Queen of Scots. Mary's deposition, imprisonment, escape, and flight to England.
  (*d*) Plots against the Queen. Mary's execution.
  (*e*) Note the general outlines of Elizabeth's foreign policy: at first to preserve the friendship, or at least to prevent rupture with France and Spain; afterward to prevent these powers invading England by (i.) helping the Netherlands against Spain, and (ii.) the Huguenots against France.
  (*f*) General improvement in country. Increased trade; restored coinage; regulations for the relief of the poor; improved methods of agriculture; introduction of the weaving industry by French and Flemish refugees; disappearance of ill-will of Catholics and Protestants; development of a national patriotic spirit.
  (*g*) The Spanish Armada, and results.
  (*h*) The Irish Rebellion.
  (*i*) The growth of Puritanism.
  (*j*) Advance of Parliament. (Freedom from arrest asserted. Claim to punish members and to determine contested elections. Bill for Abolition of Monopolies passed.)
  (*k*) The Poor Laws.

5. *Arithmetic.*—Read up the theory of proportion carefully. It is treated very fully in the text-book.

6. *Quadratics.*—Work by formula, which you should be able to establish. Thus—

Any quadratic can be expressed by the form $ax^2 + bx + c = 0$, where a is the coefficient of x^2, b of x, and c the numerical part.

Solve this by completing the square.

$$ax^2 + bx = -c.$$

$$x^2 + \frac{bx}{a} + \left(\frac{b}{2a}\right)^2 = -\frac{c}{a} + \left(\frac{b}{2a}\right)^2.$$

$$x + \frac{b}{2a} = \sqrt{-\frac{c}{a} + \left(\frac{b}{2a}\right)^2}.$$

$$x = -\frac{b}{2a} \pm \sqrt{-\frac{c}{a} + \left(\frac{b}{2a}\right)^2}$$

$$= -\frac{b \pm \sqrt{b^2 - 4ac}}{2}.$$

Be able to prove that a quadratic can have only two roots. If x^3 occurs there are *three* roots, x^4 *four* roots, etc.

7. *Domestic Economy.*—Note the various processes of cooking, and the object of each. The purposes served by cooking—(*a*) to destroy parasites, (*b*) to assist digestion, (*c*) to render more palatable by varying foods, etc. Read up also the means of preserving foods—salting, tinning, canning, freezing, etc.

Test Questions.

1. *Penmanship.*—Write, as specimens of copy-setting :—
  (*a*) Large Hand—*Illogically.*
  (*b*) Small Hand—*With other notes than to the Orphean lyre,*
  I sung of chaos and eternal night.

2. What position should you attempt to secure for children when writing, as a matter of health? What drill should you use to get the pen held properly?

3. In choosing a style of writing for teaching, by what considerations would you be influenced?

4. Point out the importance of Afghanistan to us. Draw a sketch-map showing the three chief towns, and the positions of the Indian and Russian frontiers.

5. Say what you can of the industries and towns of Asia Minor.

6. Mention, with dates if you can, risings in the times of the Tudors which were due to discontent caused by religious changes, taxation, or poverty. Give a short account of one of these risings. Mention (*a*) causes which in that period produced distress and vagrancy; (*b*) any measures taken to meet these evils.

7. State, shortly, the main objects of the foreign policy of Henry the Eighth.

8. What reasons may be alleged to justify Queen Elizabeth's treatment of Mary Queen of Scots?

9. Paraphrase the following, and analyse the words in italics :—

> "I have [that is, expounded it well], when you have heard what I can say :
> And know it now :—the senate have concluded
> *To give* this *day* a crown to mighty Cæsar.
> If you shall send them word you will not come,
> Their minds may change. Besides, it *were* a mock
> *Apt to be rendered*, for *some* one to *say*,
> 'Break up the senate till another time,
> When Cæsar's wife shall meet with better dreams.'
> If Cæsar hide *himself*, shall they not whisper,
> 'Lo, Cæsar is afraid'?"

CORRESPONDENCE: RULES.

To ensure an answer in the next issue, queries must be sent by the 15th of each month.

Name and address of sender, with coupon of current number of THE PRACTICAL TEACHER (and *nom de plume* if desired), must be enclosed.

As a rule, all replies will appear in the Correspondence Column; but any one desiring an immediate reply may obtain it by enclosing a stamped addressed envelope.

All communications and queries with regard to the PUPIL TEACHERS' AND SCHOLARSHIP COURSE should be addressed to "Mr. A. T. FLUX, The Bays, Belvedere, Kent."

ANSWERS TO CORRESPONDENTS.

Poppy.—Fairly good essay, 15/20.

Doubtful.—The book has been changed. (See above.)

(*Other Correspondents answered by post.*)

OUR CERTIFICATE COURSE FOR 1901.

BY GEORGE COLLAR, B.A., B.SC.,
Head-Master of the Stockwell Pupil Teachers' School.

TEST QUESTIONS ON LAST MONTH'S WORK.

Theory of Teaching.

1. Show the importance of teaching history in elementary schools.

2. In what ways is a knowledge of geography helpful and essential in the study of history?

3. What special methods would you adopt in training your pupils in habits of (*a*) truthfulness, (*b*) punctuality, and (*c*) politeness?

Arithmetic.

1. Why is not the discount on a sum of money proportional to the time? If the discount on a bill for £480 for a certain time is £30, find the discount on another bill for £480 for half the time at the same rate per cent.

2. If the true discount on £260 for six months is equal to the simple interest on £250 for six months, find the rate per cent., which is the same in both cases.

English Grammar and Literature.

First Year.—1. With what great writers does Macaulay compare Milton? Give the leading points of the comparisons.

2. What arguments does Macaulay use to prove that Milton had greater difficulties to contend with than poets in the earlier days of civilisation?

Second Year.—1. Illustrate from *Henry V.* any changes which have taken place in the language since the time of Shakespeare.

2. What part is served by the chorus in Shakespeare's *Henry V.*? How does it compare with the chorus in the Greek drama?

Geography.

Both Years.—1. Write an account of the different races included in the population of the Austro-Hungarian Empire.

2. What were the different states of which Italy consisted in the first half of the nineteenth century, and how was "Italian unity" brought about?

3. Give an account of the social condition of the people of Italy and of the productions of the country.

History.

Both Years.—1. Give an account of the "Battle of the Nile," and show what important results followed from it.

2. Give an outline of events in India from 1789–1815.

Algebra.

Women—Both Years.—1. Simplify:—

i. $\dfrac{(x^3 - y^3)(x^4 - y^4)}{(x^5 - y^5)(x - y)}$.

ii. $\dfrac{a^2 + b^2 - c^2 - d^2 + 2ab + 2cd}{a^2 + c^2 - b^2 - d^2 + 2ac + 2bd} \div \dfrac{a^2 + c^2 - b^2 - d^2 - 2ac - 2bd}{a^2 + b^2 - c^2 - d^2 - 2ab - 2cd}$.

2. A man can row m miles down stream in k hours, and n miles up stream in l hours. Find the velocity of the stream.

Men—First Year.—1. Find two numbers such that their sum, their difference, and the sum of their squares are in the ratio 5 : 2 : 29.

2. If a, b, c, and d are in proportion, prove that $(a + b + c + d)(a - b - c + d) = (a - b + c - d)(a + b - c - d)$.

Men—Second Year.—1. Write the term involving x^3 in each of the following expressions:—

(i) $\left(x - \frac{1}{x}\right)^7$; (ii) $\left(x + \frac{1}{x}\right)^{19}$; (iii) $(1 - x + x^2 - x^3)^4$.

2. Show that $x^2 + x + 1$ is odd for all integral values of x.

Euclid.

Women—First Year.—Prove that the five angles in the points of the star-shaped figure formed by producing all the sides of a pentagon both ways are together equal to two right angles.

Women—Second Year.—Divide a given straight line into two parts, so that the square on one part shall be equal to twice the rectangle contained by the whole and the other part.

Men—First Year.—If two chords be drawn through a given point within a circle, the greater is the one which makes the smaller angle with the diameter through the point.

Men—Second Year.—Construct a triangle, having given the centres of its inscribed and of two of its escribed circles.

French—Both Years.

1. Account for the agreement or non-agreement of the participles in the following passages:—
   (*a*) Il est *arrivé* des troupes.
   (*b*) Autant de parties il a *jouées*, autant il en a *perdues*.
   (*c*) J'ai trouvé des framboises et j'en ai *mangé*.
   (*d*) Les orages qu'il y a *eu*.
   (*e*) Les oranges qu'il a *eues*.
   (*f*) Les années que j'ai *vécu*.
   (*g*) Les cerfs que les chasseurs ont *courus*.
   (*h*) Les deux kilomètres que nous avons *couru*.

2. Translate into English:—Les assiégés avaient profité de la trêve pour se procurer les secours et les vivres nécessaires. Les chrétiens ne déployèrent au pied des murs qu'une valeur impuissante, et la ville, après sept mois de siège, pouvait braver encore longtemps la force de leurs armes, si l'ambition et la ruse n'avaient fait pour la cause des croisés ce que n'avaient pu faire la patience et la bravoure.

3. Translate into French:—Alfred de Vigny was born at Loches, on March 27, 1797. He was a man of rank, and his marriage in 1826 with an Englishwoman of wealth gave him independence. He left the army, in which he had served for some years, in 1828, and spent the rest of his life, until his death in 1863, in literary ease.

NOTES AND SYLLABUS FOR MAY.

English Composition.

Write essays on:—

1. The Prospects of the Twentieth Century.
2. Description of a great forest.
3. Contentment.
4. Choice of an Occupation for a Teacher's Son.

Theory of Teaching.

Second Year.—Methods of teaching *drill*, *music*, and *drawing*.

Drill.—Consider the objects:—(*a*) To physically develop the individual child. Under this head we must attend to: 1. *General build of the body.*—Such faults as "round shoulders" are corrected by a proper system. 2. *Ease and grace of movements.*—It is not sufficient to cultivate a form which is erect when stationary; the movements must be easy and graceful, not stiff and mechanical. 3. *The development of the muscles.*—These grow with exercise, but the exercise should not reach the point of fatigue, and as many muscles as possible should be called into play. 4. *The exercise of the respiratory organs.*—The breathing should be effected through the nose; the lips should therefore be closed. Exercises in filling the lungs to their utmost extent are of great importance: they increase the "vital capacity" of the children. 5. *The circulation of the blood.*—This follows naturally on any well-regulated course of drill, and is the means by which much of the benefit of physical exercise is accomplished, as the circulation tends to remove the waste matter produced by the brain, muscles, or other organs that have been kept at work.

(*b*) To train in habits of prompt obedience and attention. From this point of view drill is invaluable in cultivating a healthy tone in the school. The words of command are generally so given that the first part puts the attention on the alert for the next, on which the movement must be made.

(*c*) To foster an *esprit de corps*. Children learn in the drill lessons, particularly, to regard themselves as parts of a whole, and if one child turns to the left when the class is told to turn to the right, the children all see how the work of the whole may be spoiled by one.

Music.—Study the advantages, both direct and indirect, of studying singing. Special books should be studied in connection with the teaching of this subject. For "voice training," see Maskell Hardy's *How to train Children's Voices* (Curwen). The music lesson has to include a variety of matters, and the student should draw up notes of lessons for different classes, showing the amount of time he would allot respectively to voice production, ear tests, modulator work, sight tests, theory, etc.

Drawing.—The requirements of the Code for the different standards should be thoroughly mastered.

Revise the Logic and Psychology.

Arithmetic.

Stocks and Shares.—The treatment of problems in stocks and shares presents no new arithmetical difficulty, but certain technical terms employed in dealing with them have to be mastered. Thus, when stocks and shares are sold *for their*

nominal value, they are said to be *at par*. Be careful not to say that "*at par*" means "for £100." This is true only for stock and for £100 shares. The nominal value of £100 stock is £100, and so is the nominal value of a £100 share; but comparatively few shares are of the nominal value of £100, and if a £50 share is sold for £100, its price is not *at par*, but *at a premium of 50*. The arithmetic books generally explain the terms *par*, *at a premium*, and *at a discount*, but leave the meaning of such words as *buying*, *selling*, and *investing* to the students' common sense. But it is either through failure to exercise the latter or from ignorance of the meaning of *buying* and *selling* that mistakes are made, and students say they are unable to distinguish *stock* from *money*. Now there is absolutely no excuse for this confusion in such expressions as £500 Great Western Railway stock, or £1,000 Queensland 3 per cent. stock, as we are told definitely enough that it is *stock*, and students may reasonably be expected to know that we do not *buy* or *sell* money but stock. Again, that which is *spent* or *invested* is money. Another serious but common fault in dealing with questions in stocks is the practice of finding a great deal more than is required. Thus, when asked to find the income, it is not, as a rule, necessary to find the amount of stock purchased; and in transferring from one stock to another it is not necessary to ascertain how much cash was received, and then how much new stock was bought, etc. The new income can be calculated directly from the old by a simple consideration of those conditions which affect the income. (See chaps. 44 and 45 in Christian and Collar's *Arithmetic*.)

Evolution.—Special attention is directed to the extraction of the roots of cubes containing not more than six digits. By inspecting the number of thousands we determine the tens digit of the root, while the units digit of the cube is the key to the units digit of the root; for example—Find the cube root of 373248. As we have 373 thousands, the root contains 7 tens, since the cube of 7 is 343; and as the last digit of the cube is 8, the units digit of the root is 2. Hence $\sqrt[3]{373248} = 72$.

Many students seem to think that the plan of finding the next n digits by division after the first $n + 1$ digits have been determined is of only theoretical interest. Its practical importance is, however, very great, and especially when combined with the contracted form of division.

The student should also revise the theoretical part of the subject and work miscellaneous problems. Chapters 17–23 in Christian and Collar should be thoroughly mastered, as should also the chapters near the end dealing with problems on clocks, etc.

English Grammar and Literature.

First Year.—Make an analysis of Johnson's Life of Milton. Commit to memory any remarkable passages, and compare Johnson's estimate of Milton's poetry with that of Macaulay.

Second Year.—The poems of Tennyson set—namely, "Maud," "The Coming and Passing of Arthur," "Ulysses," the "Ode on the Death of the Duke of Wellington," and "The Lotos-Eaters"—are appointed for the study of "style and subject matter." We shall not, therefore, give detailed notes on the poems, but commend them to our readers with the recommendation to endeavour to extract as much "enjoyment" from them as possible; that is, to try to forget that there is an examination to follow. The object of looking up the meanings of words is to gain the clearest knowledge of the general purport of the poems.

Geography.

Both Years.—*Italy*. The map is familiar to all. A sketch-map, including the neighbouring islands, should be drawn, and in addition to the most important coast features and mountains, rivers and towns, those places should be indicated which are of importance in connection with the history course. Students should be prepared to illustrate the campaigns in Italy by means of sketch-maps. A special map of the valley of the Adige should be prepared to illustrate Napoleon's campaign of 1797. This should show how the four Austrian armies came down from the Tyrol to the relief of Mantua, and were successively defeated at Lonato and Castiglione, at Primolano and Bassano, at Arcole, and at Rivoli.

In studying the geography, it is convenient to take the two great natural divisions separately—namely, *continental* and *peninsular* Italy—as these have some widely-different characteristic features.

The continental portion is a wide, fertile plain, bounded on the west and north by the Alps, and watered by the Po and its tributaries. Notice that Ticino, although Italian in its characters and population, forms one of the cantons of Switzerland. This portion consists mainly of the great Plain of Lombardy, which is both the great agricultural and manufacturing part of Italy. Cereals, rice, olive oil, poultry, eggs, butter, and cheese are important products, large quantities being sent to England. The wheat is particularly fine and glutenous, so that it is fitted for the manufacture of macaroni, vermicelli, and "Italian paste." Silkworms are fed on the leaves of the numerous mulberry trees, and the silk and velvet produced in Turin and Genoa are very famous.

Some of the wealthiest cities of Italy and cities of great importance in mediæval history are situated in this plain. Some of the towns, too, are very strongly fortified, and from their strength and position are of great strategetic importance.

In this part of Italy are found the lakes so celebrated for their scenery—Garda, Maggiore, and Como, with Lugano, loveliest of them all, between the two last.

The two great outlets by sea for the commerce of this part are Venice and Genoa; though, with the fall of its political influence, the former has also lost most of its trade, and is mainly visited for its buildings and art collections—the memorials of its former grandeur. Since the cutting of the Mont Cenis and St. Gothard tunnels a great volume of trade has sprung up overland with France, Switzerland, and Germany. Trace carefully the course of the railways passing through these tunnels, and particularly the line going on to Brindisi, as that is the one over which the Indian mails pass. Note also the great Æmilian road from Rimini on the coast, through Modena, Reggio, Parma, to Piacenza. The last-named is the terminus of this famous road, because it was the lowest point at which the Po could be bridged, as the banks lower down become marshy. Note the delta of the river; the land has been pushed so far out to sea that Ravenna and Adria (which gave its name to the Adriatic Sea) are now some miles inland.

English History.

Both Years.—On land, as we have seen, Napoleon gained material successes, and advanced from Egypt, through Syria. Near Acre, the convoy and siege train with which he intended to lay siege to the town were captured by Sir Sydney Smith, who mounted these very guns to defend the town in the interval caused to the French by the delay in replacing them. On the 7th of May strong Turkish reinforcements arrived from Rhodes. Bonaparte then ordered the assault of the town, and one angle of the fortifications was captured. As the Turkish soldiers were obliged to land slowly in boats, Smith landed the sailors from his ships to resist the assailing French troops, and after a fierce struggle of twenty-four hours the French were obliged to withdraw. Just after this, a French fleet of twenty-five ships eluded Lord Bridport's blockade, and escaped from Brest, and entered the Mediterranean. Earl St. Vincent observed them pass Gibraltar; but as his command was split up and engaged in blockading various ports, the work of bringing them together caused his health to break down, and he resigned. The Spanish fleet was then able to leave Cadiz and enter Cartagena, where it was joined by the French, and the combined fleet entered Brest.

On August 22, 1799, Bonaparte secretly embarked at Alexandria to return to France, two months after he had defeated a Turkish force that had landed at Aboukir. In spite of this, the French under Kléber were in great straits, as the British ships shut off all communication with France. A convention was drawn up at El Arish between Kléber and the Turkish commander, by which the Turks were to furnish transports to enable the French to return to France. Although Sir Sydney Smith did not sign this, he knew of it, and assented to it, although his direct orders were to prevent any of the French from leaving Egypt, except as prisoners of war. As Kléber had, however, carried out some conditions required by the convention, the British Government decided to recognise it, although Smith was censured for exceeding his duty. Affairs lingered on for some time. Kléber was assassinated, and General Abercromby was killed after successfully leading the British in the battle of Alexandria, and the last of the French troops did not leave Egypt till September 1801.

The policy of the French, as we have said, was to endeavour to destroy our commerce. This course was relieved by two or three expeditions to Ireland, the most important of which was under the famous general, Lazare Hoche. Owing to the inefficiency of the British blockade it was able to leave Brest and reach Bantry Bay. The weather caused the loss of five ships, and six were captured by the British, and the expedition was a failure.

Under the influence of Napoleon a league of "Armed Neutrality" was formed by the powers of the north of Europe, but after the attack of Nelson on Copenhagen this was dissolved. Russia was endeavouring to establish a control over Malta, and seized three hundred British merchantmen with their crews. In retaliation, Great Britain seized two hundred ships of the allies, and

ordered the seizure of all their ships met with at sea. On the 17th of June a convention was signed at St. Petersburg, settling the vexed question of the position of neutrals as carrying agents for countries which were at war.

By the Peace of Amiens, Great Britain had consented to restore all places conquered during the war. This was a great concession. But Pitt's policy was not one of expansion; his aim was to assure the security of the British Isles. "Security," he said, "was our great object. There were different means of accomplishing it, with better or worse prospects of success; and according to the different variations of policy occasioned by a change of circumstances, we still pursued our great object, security." The Treaty of Amiens was signed March 25, 1802, but Bonaparte's actions soon caused grave offence in England. Among them we may mention the formal incorporation of Elba and Piedmont with France, and the seizure of Valais. Great Britain was the only Power that protested against this oppression of Switzerland, and its remonstrance threw Bonaparte into a great fury, and he directed the French minister in London to state that the policy of France towards England was "the whole Treaty of Amiens, and nothing but the Treaty of Amiens." Against this the British Government set "the state of Europe when the Treaty of Amiens was signed, and nothing but that state." To maintain a strong position in this matter, the British Government countermanded the orders previously sent for the restoration of conquered territories. But the chief difficulty arose over Malta. By the Treaty of Amiens this was to be made independent, and restored to the Knights of Malta. As France would take no steps to secure a guarantee of the independence of the island from the other Powers, it was concluded that Bonaparte had designs upon the island. This opinion was strengthened by the publication of the report of Colonel Sébastiani, who had been on a mission to the Levant, which showed clearly that Bonaparte still cherished designs for attacking British power in the East.

This report made the British Government decide not to evacuate Malta until some substantial security had been given that France did not intend to attack us in the East. On May 12, 1803, the British ambassador demanded his passports and came home, and on the 16th war was declared against France.

The preparations of Bonaparte at Boulogne are well known to our readers; the plan of uniting the French ships of war which were in the various ports, in order to gain the control of the English Channel and enable the flotilla of flat-bottomed boats to cross, is generally overlooked. It was, however, fully appreciated by our Admiralty, who met it by strictly blockading all French ports. This work was carried out by Cornwallis off Brest, Collingwood off Rochefort, Pellew off Ferrol, while Nelson watched Toulon. By treaties still in existence at that time both Holland and Spain were bound to provide France with ships of war if called upon. As Spain announced her intention of so doing, and did also actually pay subsidies that Bonaparte demanded, war was declared against that country too.

In January 1805, Napoleon's great plan for a naval combination began to take effect. Under his orders the squadron from Rochefort managed to escape and steer for Martinique, which was reached on 20th February; four days later six of the British ships blockading Ferrol went there in pursuit of it. Villeneuve also managed to escape Nelson's vigilance at Toulon at the end of March, having been obliged by heavy weather to return after successfully getting out in January. He was joined by a Spanish division at Cadiz, and sailed on to Martinique, which he reached on 14th May. Such was the closeness of Cornwallis's blockade of Brest that Admiral Ganteaume with twenty-one ships was unable to leave that harbour to join Villeneuve. Firmly convinced of the French designs on Egypt, Nelson went to seek Villeneuve there, but learning he had gone to the West Indies, he hurried on to seek him there. Villeneuve returned to Europe, and owing to the slackness of the British admiral blockading Ferrol, effected a junction with the French and Spanish ships from that port. After this, Villeneuve sailed for Cadiz, which was blockaded by Collingwood with only four ships. He allowed the French to enter, but resumed his watch; and being joined by twenty-two ships, he kept the enemy in that port until 28th September, when Nelson, who had paid a short visit to England, arrived, and took chief command. This closed for ever the possibility of effecting Napoleon's grand scheme of naval combination. He then turned his attention to matters pressing in other directions, and marched his army from Boulogne to the upper Danube, where Ulm capitulated the day before his fleet was destroyed at Trafalgar. Napoleon thought to favour his plans by creating a diversion by ordering Villeneuve to leave Cadiz on the first opportunity, and join the ships from Cartagena, and land men in Italy. At the same time it was understood that Villeneuve was in disfavour with the emperor, owing to want of success, and was to be replaced. He found an opportunity of leaving Cadiz on 19th October, and made for the Strait of Gibraltar, pursued by Nelson. On the 21st the battle of Trafalgar was fought, with the result that the allied French and Spanish fleet lost twenty-two ships out of thirty-three. No British ship was lost, but Lord Nelson received his mortal wound.

This action was of enormous importance, as it rendered impossible, humanly speaking, Napoleon's plan for striking an armed blow directly at England.

He had, however, another plan by which he hoped to reduce the country to impotence—namely, by destroying our commerce. This scheme was first put into action in 1803, when, a fortnight after war was declared, he seized upon Hanover and closed the rivers Elbe and Weser to British commerce. In return, British cruisers soon barred the entrance of the rivers to the merchantmen of other nations. This action was an insult to the German states which were friendly with France, and estranged them from Napoleon's cause. On the seas, at the first outbreak of war many prizes were taken on both sides, but the naval preponderance of Great Britain soon swept French merchantmen from the sea. As matters developed, the British adopted the "convoy" system, by which some two hundred or even a thousand merchant ships bound for the same parts would sail under the protection of a force of ships of war. In addition, cruisers were told off to patrol the ocean trade routes, while privateers sought the parts frequented by the French. In spite of the commerce-destroying policy of the French, it appears that only about 2½ per cent. of the trading ships of the empire were captured; but such was the volume of trade which the war obliged to pass through British vessels that our commerce was about double what it was in times of peace. Being unable to injure British commerce on the sea, Napoleon issued his famous Berlin Decree, declaring the British Isles in a state of blockade, although he could not station a single ship outside one of our ports. According to this decree all merchandise exported from Great Britain was lawful prize for whoever seized it; and not only was the property of every individual Englishman on the Continent declared to be forfeited, but all property of English origin belonging to a citizen of any European country.

The decree was of very little effect until Napoleon had defeated the Russians at Friedland; but on 8th July, after that battle, the Czar Alexander agreed to assist Napoleon in enforcing it and in obliging other states to abide by it.

To retaliate, the British Government issued certain Orders in Council, the first of which forbade neutral vessels to trade in ports from which French influence excluded British vessels. Napoleon attempted to seize the Danish and Portuguese fleets. The former, after resistance had been overcome by the bombardment of Copenhagen, surrendered to Great Britain; the latter, under British persuasion, withdrew to Brazil, taking the court and treasure with it. The second Order in Council was issued on November 11, 1807, and was more stringent still. It obliged neutral vessels to call at an English port before going to and after leaving a Continental one, so that all Continental commerce, in fact, paid a toll to Great Britain. This additional expense was, of course, eventually borne by the Continental consumer, whose love for Napoleon was not increased thereby.

In response to these Orders, Napoleon issued the Milan Decree (December 17, 1807), declaring that any vessel which submitted to search by a British cruiser became lawful prize for French privateers. Then followed the Peninsular War, which our readers will easily get up from their text-books.

One effect of this commercial struggle was the vast amount of smuggling that went on in spite of the watchfulness of the French soldiers stationed all round the coast. The hardship resulting to the dwellers on the Continent was the real cause of the rise of that great opposition which led to Napoleon's downfall, the steps of which we have now not time to trace.

Algebra.

Women — Both Years. — Ratio and proportion. Prepare proofs for the leading theorems in ratio and proportion, which, after all, rest on very simple principles.

Men—First Year.—Revise the three progressions, and prepare the leading formulæ and rules in mensuration of plane surfaces. A little practice will soon fix these in the memory; they are mostly dependent for their proof on Euclid I. 47.

Men—Second Year.—Revise the theory of logarithms, and the application of them to compound interest and annuities. Mensuration of cylinders, spheres, and cones.

French.

Both Years.—General revision of grammar, with practice in translation and retranslation.

LONDON MATRICULATION.

JUNE 1901.

BY R. C. B. KERIN, B.A. (LOND.),
First in First-Class Classical Honours at Final;
Principal, Carlyon College, 55 Chancery Lane, W.C.,
AND
E. J. SCHWARTZ, M.A., B.SC.

LATIN COURSE FOR MAY.

1. Sallust, *Catiline*. Revise Sallust again.

2. Grammar.—Revise, in the syntax, the uses of the verbs; the rules for the uses of the indicative, subjunctive, and imperative. Note the Roman names and their signification—for example, *nomen, cognomen, praenomen*. Read the chapter dealing with suffixes. Note especially the formation of patronymics and diminutives.

3. *Anglicè Reddenda*, 88–98.

4. Sentences from Bradley's *Arnold* or Bayfield's or Allen's *Exercise Book*.

Latin Grammar Notes.

Diminutives are formed from words of the first and second declensions by adding *-ulus, -ula, -ulum;* from nouns of the third generally by adding *-culus, -cula, -culum*. The stem of the word is sometimes modified, and assimilation sometimes takes place. Instead of *-ulus*, etc., *-olus* is added if the stem of the word ends in a vowel—for example, *filius, filiolus*.

Examples are *filius, filiolus; filia, filiola; virgo, virguncula; homo, homunculus; amicus, amiculus; victoria, victoriola; solatium, solatiolum; aranea, araneola; sententia, sententiola; tantus, tantulus; mollis, molliculus; turpis, turpiculus; artus, articulus; res, recula*.

Examples of contractions and assimilations are *oculus, ocellus; ager, agellus*.

Examples of *oratio recta* and *oratio obliqua* —Eo mihi minus dubitationis datur quod eas res quas commemorastis memoria teneo, atque eo gravius fero quo minus merito populi Romani acciderunt; qui si alicuius iniuriae sibi conscius fuisset, non fuit difficile cavere; sed eo deceptus est quod neque commissum a se intellegebat quare timeret neque sine causa timendum putabat. Quod si veteris contumeliae oblivisci (vellet), num etiam recentium iniuriarum, quod (eo) invito iter per provinciam per vim tentavistis, quod Haeduos, quod Ambarros, quod Allobrogas vexavistis, memoriam deponere (potest)? Quod vestra virtute tam insolenter gloriamini quodque tam diu vos impune iniurias tulisse admiramini eodem pertinet.

Eo sibi minus dubitationis dari quod eas res quas legati Helvetii commemorassent memoria teneret, atque eo gravius ferre (sc. *se*) quo minus merito populi Romani accidissent; qui si alicuius iniuriae sibi conscius fuisset, non fuisse difficile cavere; sed eo deceptum (sc. *eum*) quod neque commissum a se intellegeret quare timeret neque sine causa timendum putaret. Quod si veteris contumeliae oblivisci (vellet), num etiam recentium iniuriarum, quod (eo) invito iter per provinciam per vim tentassent quod Haeduos, quod Ambarros, quod Allobrogas vexassent, memoriam deponere posse? Quod sua virtute tam insolenter gloriarentur quodque tam diu se impune iniurias tulisse admirarentur eodem pertinere.

Note also the chief patronymic endings—*ides, ïdes, ades, as, is, ine, one*.

Typical Sentences.

39. "I should not hesitate to say that all wise men are always happy, if your friend were able to convince me that men can always be happy."

Non dubitem dicere omnes sapientes semper esse beatos si amicus tuus homines semper esse beatos posse mihi persuadere possit.

Notes.—(*a*) The present subjunctive is used in both clauses, because (1) there is a "should" in the apodosis, (2) the condition refers to a future time. (*b*) *Non dubito*, "I do not doubt," followed by a "that" clause, requires *quin* and the subjunctive in Latin. When, however, *non dubito* means, "I do not hesitate to," use the infinitive in Latin, as in the sentence above. (*c*) *Persuadeo* governs the dative. (*d*) When *persuadeo* is followed by an infinitive in Latin, it means to persuade or convince a person that a thing is so. When it is followed by *ut* and the subjunctive, it means to persuade a person to do a thing.

40. "Provided that he does not injure such brave men as these, I shall make it my aim to help his excellent father."

Dum ne his tam fortibus viris noceat id agam ut patri eius viro dignissimo subveniam.

Notes.—(*a*) The negative with *dum*, "provided that," is *ne*, not *non*. *Dum* in this signification always requires subjunctive. (*b*) Note *his tam fortibus*, not *tam fortibus quam his*, as so many put. (*c*) Note that *subvenio* governs the dative. *Adiuvo* would take the accusative. (*d*) With relatives, as well as with proper names, adjectives are generally not used enthetically, but with *homo, vir,* or *femina*.

41. "He is the wisest man I know."

Omnium quos novi doctis-imus est; or, *Omnium doctissimus (quos quidem cognoverim) ille est.*

Note.—This is an important idiom. A literal translation of the English would give a different meaning. For example, *Is quem novi doctissimus est* means, "He whom I know is the wisest."

42. "He endured everything rather than denounce his accomplices."

Perpessus est omnia potius quam conscios indicaret.

Note.—In such cases where there is a question of a person placed between two alternatives, and choosing one with the fixed design of rejecting the other, the subjunctive is used.

43. "More than six thousand men were destroyed on that evil day."

Amplius sex milia hominum illo nefasto die perierunt.

Notes.—(*a*) In such cases the construction is the same as if *amplius, plus,* and *minus* were not employed. (*b*) Note the genitive *hominum* depending on *milia*. (*c*) *Pereo* is used as the passive of *perdo*. *Perditus* is the only part of *perdo* used in the passive. Exceptions are rare.

44. "He was so saddened by the death of his mother that he could never go to Syracuse without shedding tears."

Matris suae morte tam tristis factus est ut nunquam Syracusas ire posset quin fleret.

Notes.—(*a*) *Morte*, ablative of the cause or instrument; avoid using the preposition *a* or *ab* in such a case. (*b*) "His" will be translated by *suae*, and not by *eius*, because it refers to the subject of the sentence. (*c*) *Tam* used with adjectives for "so." (*d*) "So that never" is translated by *ut nunquam;* "in order that never" by *ne nunquam*. The subjunctive is used after both. As *factus est* is in a secondary tense, the imperfect subjunctive is used. (*e*) "To Syracuse," no preposition. (*f*) "Without" translated after a negative clause by *quin* and the subjunctive. Avoid using *sine* and gerund.

45. "Who could have doubted that it was all over with the army?"

Quis dubitare potuit quin de exercitu actum esset?

Notes.—(*a*) Avoid translating the interrogative "who" by *qui*. (*b*) Many will fall into the mistake of translating "could have hesitated" by *dubitavisse potuit*. Remember that *debeo, oportet,* and *possum* are not followed by the perfect infinitive. In English we use the past definite to denote past tense with the verbs "could," "ought," etc., but no other language has that idiom. (*c*) *Quin* is used to translate "that" after negative or virtually negative verbs of doubting. Here *quis dubitare potuit* expects the answer "no," hence it is virtually negative. (*d*) Note the phrase *actum est de*, "it is all over with."

46. "The first thing to be demanded of an orator is that he should speak well."

Primum ab oratore postulandum est ut bene loquatur.

Notes.—(*a*) Avoid writing *primum postulari* or *primum est postulari*. *Primum* will be used like *primus* in *primus hoc fecit*, "he was the first to do this." (*b*) Don't translate the "of" by the genitive. (*c*) The "that" clause will be expressed by *ut* and the subjunctive.

47. "Phocion supported his friend, although he might have abandoned him with impunity."

Phocion cum impune deserere posset amico suo subvenit.

Notes.—(*a*) The verb *adsum* is followed by the dative. The verb *subvenio* also takes dative. The verb *adiuvo* would require the accusative. (*b*) If *eius* were used instead of *suo*, the "his" would not refer to Phocion, but to some one else. (*c*) "Might have," *potuit* with present infinitive, not with perfect infinitive. (See example above, *dubitare potuit*.)

48. "It fills me with shame to say this, especially since you have promised to reward my brother with the citizenship."

Hoc dicere me pudet praesertim cum fratrem meum civitate te donaturum promiseris.

Notes.—(*a*) Note the construction of *pudet* impersonally with the accusative of the person and the infinitive. If a substantive were required instead of the infinitive, the genitive would be used. (*b*) *Cum* = "since," requires the subjunctive. (*c*) Note the future infinitive with verbs of promising. (*d*) *Dono* requires either (1) the accusative of the thing and dative of the person, or (2) the accusative of the person and the ablative of the thing.

49. "Let him repent of his crimes, so that the general may be appeased."

Eum sceleris sui paenitet at ut dux placetur.

Notes.—(*a*) *Paenitet* takes the same construction as *pudet* above. (*b*) "Let him" or "let them," etc., and an infinitive are expressed by the third singular or plural of the present subjunctive. (*c*) Distinguish carefully between *placeo* (governs dative), meaning "to please," and *placo* (transitive verb), meaning "to pacify."

50. "Repent of your crimes in order that you may not be punished."

Te scelerum paeniteat ne supplicio afficiaris.

Notes.—(*a*) "Repent" = "let it repent you;" therefore *te paeniteat* is used. *Vos paeniteat* would be used if two or more persons were addressed. (*b*) Do not use *ut non* instead of *ne*. The former is used in negative result clauses. (*c*) Do not use *crimen* in the sense of crime. In classical prose it means an "accusation."

51. "He deserves to have this prize given him."

Dignus est cui hoc premium detur.

Note the use of *dignus* with *qui* and subjunctive. The use of *ut* or the infinitive would be incorrect, though the later construction is found in poetry and in *bad* exercises, especially in the latter, perhaps owing to poetical tendencies. In examinations, however, all such poetical feelings should be sternly suppressed.

52. "He did this not because he was afraid of death, but because he thought that you disagreed with him."

Hoc fecit non quo (*quod*) *mortem timeret sed quod te sibi dissentiri putabat.*

Notes.—(*a*) *Non quo* or *non quod* takes the subjunctive, because when a reason is denied it is a reason given by some one else; and as, in Latin, sentences which express the thoughts or opinions of some one else are put in the subjunctive, being considered to be in *oratio obliqua*, the subjunctive is employed. (*b*) *Dissentior* governs the dative.

Sentences for Practice.

(Readers can have their solutions corrected by sending them to the Editor, Matriculation Course, *P. T.*, and enclosing seven stamps.)

1. It is ninety years since he was king. He had reigned thirty years.
2. He was so delighted by the death of this man that he could never go to Rome without telling his friends how joyful he was.
3. If I had asked you to do this, I should not have been prevented from going away.
4. I should not have persuaded you to go away if you had informed me of this ten days ago.
5. There are some who are afraid to die for their native land; many would rather die thus than live without honour.
6. The first thing to be demanded of a writer is that he should write good Latin.
7. The good Cicero supported his friends, though he might have abandoned them with impunity.
8. He stopped in the city of Rome till the senate broke up.
9. Hearing that Pompeius was ten miles away from Rome, he wheeled around his forces and charged the enemy, who were off their guard.

Test Paper.

(Readers can have their answers corrected by enclosing seven stamps to Editor, Matriculation Course.)

1. Give the first person plural future and imperfect of *possum, gero, pereo, saevio, oro, queror, sperno.*
2. Give the genitive singular and plural of *nubes, parens, opus, cassis, grates, quercus, sermo, manus.*
3. Write out the singular of *is, celer, domus, supellex, acer.*
4. Parse and give the meaning of *niveus, elephantis, sceleri, paludi, mori, quoque, clavi, creri, rueris, palus, talis.*
5. Give an example of an impersonal verb, a deponent verb, a defective verb, a semi-deponent verb, and an intransitive verb.
6. Give examples of the construction of *quin, dum, ne, poenitet, interest, licet, pertinet.*
7. Write short sentences to illustrate the difference in use and meaning between *post, postea*, and *postquam; ibi, ubi, unde*, and *quo; hic, huc*, and *hinc; quantus, qualis*, and *quot.*
8. Put into Latin:—(1) If he were made consul, I should go to Capua; (2) Unless you had forgiven me, I should never have returned; (3) I asked her to come when she could; (4) I will send the biggest book I have.

Erratum.—In Matriculation Course for last month, in Sentence 37, *irascor* should, of course, be *irascar.*

ENGLISH COURSE FOR MAY.

1. Grammar.—Nesfield, pp. 266–309; Appendix on Prosody, pp. 435, etc.; Figures of Rhetoric, Synonyms, and Changes of Meaning of Words, p. 445 to the end. Read also, very carefully, pp. 369–420; also read Grimm's and Verner's Laws, pp. 420–423.
2. Revise Hales's *Longer English Poems* and Stopford Brooke's *Primer of English Literature.*
3. History.—Revise the history.

Grammar Notes.

The history of our alphabet is very important. Note, on p. 266, how our present alphabet differs from the Anglo-Saxon alphabet. The Anglo-Saxons brought to England the runic alphabet, but on their conversion to Christianity a British modification of the Latin alphabet was adopted by the English, and three runic letters were kept—namely, *th* (called *thorn*), *th* (called *eth*), and *w* (called *wen*). Note that *j, q*, and *v* were borrowed from the French; *k* and *z* were rarely used. The classification of the consonants on pp. 268, etc., is very important. Note that they are divided (1) according to the organ principally used in pronouncing them; (2) according to the degree in which they obstruct the passage of the breath. I do not think a Matriculation candidate can be expected to enter into the intricate question as to how the sounds are formed. § 430 and § 431, therefore, need only be read through. § 432 is very important. The rules given with regard to assimilation should be thoroughly known. Learn some examples of the vocalisation of consonants (§ 433). Learn, in § 434, some examples of the substitution of one voiced consonant for another, and of a voiceless consonant for another. § 436. Metathesis is a very important phenomenon in English. Note, in § 437, the reasons why initial *h* causes so much difficulty to some English people. In § 438, note what palatalisation is, and learn some examples of this process. § 439, on vocalic sounds, may be omitted; but § 440, which treats of the classification of vocalic sounds, is important. Note, in § 441, that final *e* in English words is often a device to indicate that the preceding syllable is long. This *e* is considered by Skeat to have had its origin in the *e* used as the inflection of the dative case. In words like *wrote* or *arose* the final *e* is due to analogy. In § 442, learn some instances of "vowel shifting." Note, in § 450, the changes in sound which the diphthong *ea* has undergone. In § 452, note *umlaut* or vowel mutation occurring when a suffix is added. Note the chief classes of *umlaut* in English. This is extremely important. In § 453, note that *ablaut* or vowel gradation is to be distinguished from *umlaut* or vowel mutation. Ch. xxiv., dealing with English spelling, is a very important one. Note the causes which led to the imperfection of our spelling. Note the reasons why our modern spelling is not phonetic. Learn examples of what is known as etymological spelling—that is, spelling words in order to show their derivation, regardless of the pronunciation. For example, *doubt* and *debt* owe their *b* to the fact that they came ultimately from *dubitare* and *debeo;* but as they came through the French *doute* and *dette*, there should be no *b*. This idea was carried so far that some words whose derivation was incorrectly surmised were spelt in accordance with this incorrect etymology. For example, we have the word *scent*, which was wrongly thought to be connected with *science*, though it really comes from the Latin *sentire*, and should therefore have no *c*. In the same way, *scissors*, which comes from *caedo*, was believed to have come from *scindo*, and hence this word is spelt with *sc*. *Rhyme* is another good example of false etymological spelling. In pp. 296, etc., note how the English alphabet is defective, (1) because the same letter has different sounds, (2) because the same sound is represented by different letters. Learn examples of these defects. Note the different sounds which the vowels have in English, and learn examples. The reasons for these irregularities are given on p. 300 (*note*). Note on pp. 301, etc., the rules for accentuation and syllabic division.

Grimm's and Verner's Laws are both important for Matriculation candidates, and should be known thoroughly. The vowel shifting between English and German need not, I think, be known. It is abandoned by Skeat, as the shifting is not consistent, and there are far more exceptions than examples. It is, therefore, useless to learn a law which is honoured more in the breach than in the observance. Note the bilingual character of English. The chapters dealing with prosody and poetry are very important. Learn the definitions of prosody, rhythm, rhyme, assonance, alliteration, cæsura, metre, iambus, trochee, anapæst, dactyl, spondee, scansion. Note, in § 592, the definition of blank verse. Candidates should learn ten lines of blank verse. In §§ 593, etc., learn the definitions of the heroic couplet, the sonnet, ottava rima, Spenserian stanza, quatrain, triplet. Note, in § 599, the difference between prose and poetry; and, in § 600, the chief peculiarities of *poetic diction*. Note, in § 601, the different kinds of poetry. The figures of rhetoric mentioned in Appendix II. are very important, especially *simile, metaphor, fable, parable, allegory, metonymy, synecdoche, euphemism, climax, anticlimax, epigram, irony, litotes, apostrophe, onomatopœia, circumlocution, hyperbole.*

ARITHMETIC COURSE.

Read chapters xxxvi. to xxxix. of Pendlebury.

Solutions to examples :—

1.
$$\begin{array}{r|l} 3 & 5938 \text{ feet.} \\ & 1979 \text{ yds. } 1 \text{ ft.} \\ 2 & \\ \hline 11 & 3958 \text{ half-yds.} \\ 40 & 359{\cdot}9 \text{ half-yds., or } 4 \text{ yds. } 1 \text{ ft. } 6 \text{ in.} \\ 8 & 8 \text{ furlongs } 39 \text{ poles.} \end{array}$$

1 mile 39 poles 2 ft. 6 inches.

2. The area of a circle is approximately the product of the square of the radius by $\frac{22}{7}$, or 3·14159.

Area of circle radius 50 yards = 7854 sq. yds.

The side of a square of same area $= \sqrt{7854}$ yds.
$= 88{\cdot}62$ yds.
$= 88$ yds. 1 ft. 10 in.

Examples :—

1. What sum of money will amount to £88, 4s. in two years, at 5 per cent. compound interest?

2. The present value of a sum of money, due three years hence, is £150; in two years' time it will be £160, 3s. 4d. Find the rate per cent. compound interest.

GEOMETRY COURSE.

Finish Euclid, Book IV.

Solutions to riders :—

1. The line joining the given point to the point of intersection of the diagonals of the parallelogram will bisect its area. The proof is easy with a figure.

2. Let ABC be a triangle, having the square on AC greater than the sum of the squares on AB and BC. Then will the angle ABC be obtuse, for it cannot be acute, for then the square on AC would be less than sum of the squares on AB and BC; nor can it be a right angle, for then square on AC would equal sum of squares on AB and BC. Hence it is obtuse.

Riders :—

1. If ABC be a triangle right-angled at A, and AD be perpendicular to the hypotenuse BC, prove by Book I. that rectangle CB, BD is equal to square on AB.

2. Describe a circle touching a given straight line and passing through two given points.

ALGEBRA COURSE.

Read the first half of chapter xxxi. and the whole of chapter xxxiii. of Hall and Knight.

Solutions to examples :—

1. $x^2 + 4xy + 3y^2 + 2x + 4y + 1 = 0.$

$\therefore x^2 + 2(2y + 1)x = -3y^2 - 4y - 1.$

$\therefore x^2 + 2(2y + 1)x + (2y + 1)^2 = (2y + 1)^2 - 3y^2 - 4y - 1$
$= 4y^2 + 4y + 1 - 3y^2 - 4y - 1$
$= y^2.$

$\therefore x + 2y + 1 = \pm y.$

$\therefore x = -3y - 1,$ or $-y - 1.$

Hence also the factors of the expression are
$(x + 3y + 1)(x + y + 1).$

2. $154(x^2 - 1) = 435x.$

$\therefore x^2 - \frac{435}{154}x - 1 = 0.$

$x^2 - \frac{435}{154}x = 1.$

$\therefore x^2 - \frac{435}{154}x + \left(\frac{435}{308}\right)^2 = 1 + \left(\frac{435}{308}\right)^2 = 1 + \frac{189225}{94864} = \frac{284089}{94864}.$

$\therefore x - \frac{435}{308} = \pm \frac{533}{308}.$

$\therefore x = \frac{435 \pm 533}{308} = \frac{22}{7},$ or $-\frac{7}{22}.$

Examples :—

1. Insert two numbers between 3 and 18 so that, of the four numbers thus formed, the first three are in G.P. and the latter three in A.P.

2. Prove $(x - 3y)^3 + (2x - y)^3 + (4y - 3x)^3$
$= 3(x - 3y)(2x - y)(4y - 3x).$

3. Factorise $a^4 + 64.$

SCIENCE COURSE.

Read chapters xv. and xvi. in the Hydrostatics, and finish the Heat portion in Briggs and Bryan.

In Loney's *Mechanics*, chapters x., xi., and xxiii.

Illustrative examples :—

1. Find a geometric series whose second term is 6, and sum to infinity 49.

Here we have— $ar = 6 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$

$$\frac{a}{1 - r} = 49 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$$

From (2), $a = 49(1 - r).$

Substituting in (1), $49r(1 - r) = 6.$

$\therefore 49r^2 - 49r + 6 = 0.$

$\therefore (7r - 1)(7r - 6) = 0.$

$\therefore r = \frac{1}{7}$ or $\frac{6}{7}.$

And by (1), $a = \frac{6}{r} = 42,$ when $r = \frac{1}{7}$; or 7, when $r = \frac{6}{7}.$ So that the series is 42, 6, $\frac{6}{7}$; or 7, 6, $\frac{36}{7}.$

2. If the price of coal be raised 10 per cent., find by how much per cent. a man must reduce his consumption so as not to increase his expenditure.

Owing to the rise in price, £110 buys the same amount of coal that £100 did formerly; so that, after the rise in price, £100 would only buy $\frac{100}{110}$, or $\frac{10}{11}$ of the amount of coal it did before.

Hence the consumption must be reduced by one-eleventh, or by $\frac{100}{1100}$, or $9\frac{1}{11}$ per cent.

3. Find the vulgar fraction equivalent to $\cdot 791\dot{6}$, explaining each step in the process.

Let $D = \cdot 791666 \ldots$

$\therefore 10000D = 7916{\cdot}66 \ldots \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$

And $1000D = 791{\cdot}66 \ldots \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (2)$

$D = 79166 \ldots$

By subtracting (2) from (1), $9000D = 7125.$

$\therefore D = \frac{7125}{9000} = \frac{19}{24}.$

4. What values of x will make the expressions $x^5 - x^4 - 2x^3 + 2x^2 - 3x + 3$ and $x^3 + x^2 - 3x - 3$ both zero?

By the ordinary method, the H.C.F. of these two expressions can be found to be $x^2 - 3.$

The values of x required are given by $x^2 - 3 = 0$—that is, $x = \pm \sqrt{3}.$

5. Simplify—

$$\frac{1}{a(a - b)(a - c)} + \frac{1}{b(b - c)(b - a)} + \frac{1}{c(c - a)(c - b)}.$$

The above expression

$$= -\frac{1}{a(a - b)(c - a)} - \frac{1}{b(b - c)(a - b)} - \frac{1}{c(c - a)(b - c)}$$

$$= -\frac{bc(b - c) + ca(c - a) + ab(a - b)}{abc(a - b)(b - c)(c - a)}$$

$$= \frac{(b - c)(c - a)(a - b)}{abc(a - b)(b - c)(c - a)} = \frac{1}{abc}.$$

6. A uniform force of 20 lbs. acts on a body initially at rest, and causes it to move through 24 ft. in the first second. Find the mass of the body.

By the formula, $s = \frac{1}{2}$ ft.^{2},
$24 = \frac{1}{2}f.$
$\therefore f = 48.$

$\therefore P = mf = 20 \times 48$ poundals $= \frac{20 \times 48}{32},$ or 30 lbs.

7. A specific gravity bottle full of water weighs 100 grams; 50 grams of a solid are introduced, and the overflowing water removed, and it is found to weigh 120 grams. Find the specific gravity of the solid.

Bottle full of water + solid (not in bottle) weigh 150 grams.

Bottle full of water + solid in it weigh 120 grams.

$\therefore$ weight of water overflowed = 30 grams.

$$\therefore \text{specific gravity} = \frac{\text{weight of solid}}{\text{weight of equal volume of water}}$$
$= \frac{50}{30} = 1{\cdot}6.$

8. Sum to infinity $1 - \cdot 1 + \cdot 01 - \cdot 001 + \ldots$

Here $r = -\cdot 1 \div 1 = -\cdot 1.$

$\therefore s = \frac{a}{1 - r} = \frac{1}{1 + \cdot 1} = \frac{10}{11}.$

Next Month:

EDUCATIONAL SYSTEMS OF

THE CHIEF COLONIES OF THE BRITISH EMPIRE.

Notes on Mr. Sadler's Newest Special Reports, Board of Education.

OUR QUERY COLUMN.

RULES.

1. Each correspondent is restricted to *one* question.
2. Each query must be accompanied by the name and address of the correspondent, and the *coupon* which appears on the back wrapper of the current number of the Journal.
3. CORRESPONDENTS MUST IN ALL CASES STATE THE SOURCE FROM WHICH THEIR QUERY HAS BEEN OBTAINED.

The Editor reserves to himself the right to decline to answer any question which is, in his judgment, unsuited to the Magazine.

W.E.G.—Get the latest edition (Eighth) of Mrs. Fawcett's *Political Economy for Beginners* (Macmillan).

R.P.B., Lucknow.—It is a difficult matter to answer your questions without much fuller information. As to (1): Syllabuses are naturally drawn up to suit the varying needs of different districts. You will find some very good schemes in the Evening School Code, issued by the Board of Education, Whitehall; and again, the various schemes given in the English Day School Code are very satisfactory from the practical standpoint. The London School Board have a very good scheme, a copy of which could be got upon application. You will find Cartwright's *Domestic Science* (2s.), *Elementary Chemistry* (2s.), and "*Sections I. and II.*" *Physiography*, and Castle's *Practical Physics*, very suggestive books, in respect both to a syllabus and to the practical carrying out of the same. (2) Nelson's Science Readers (London), Paul Bert's *First Year of Scientific Knowledge* (Relfe Brothers, London), Miall's *Object Lessons in Nature* and *The World's Lumber Room* (Cassell, London), Murché's Science Readers (Macmillan, London), are a few of the books that occur to us, but it is difficult to select until one actually knows both the children and the syllabus they are to cover. (3) The books given under (1) all give full particulars of apparatus required. In addition, Cox and Co., New Oxford Street, London, Brown of Hull and York, and Laurie of Paternoster Row issue sets of apparatus and objects suitable for object lessons. We advise you to communicate with these firms, and to give exact particulars as to your needs. The lessons on Practical Elementary Science that have appeared and are still appearing in our columns should be of considerable assistance to you.

Tyro.—A uniform and perfectly flexible thread (or chain) is placed on a smooth horizontal table so that one end just hangs over the edge, and consequently the end falls, dragging the rest of the thread after it. Find (*a*) the acceleration of the velocity at the instant when an assigned length is hanging; (*b*) the work that has been done by gravity up to that instant; (*c*) the velocity of the thread at that instant.

If l denote the length of the chain, and m the mass of unit length, then ml is the mass of the chain.

(*a*) Let x denote the assigned length: its mass will be mx, and the force causing motion is $mx \times g$.

$$\text{Hence the acceleration } f = \frac{mgx}{ml} = \frac{gx}{l} \quad . \quad . \quad . \quad . \quad . \quad (1)$$

(*b*) The work done by gravity up to that instant will obviously be equal to that which would be necessary to be done to raise the chain to its initial position—that is,

$$mgx \times \tfrac{1}{2}x = \tfrac{1}{2}mx^2g.$$

(*c*) Let V denote the velocity when a length x is hanging; then, as gain of kinetic energy equals loss of potential energy, we have—

$$\frac{ml\mathrm{V}^2}{2g} - \frac{mx^2}{2} = 0.$$

$$\therefore \mathrm{V}^2 = \frac{mx^2}{ml}g,$$

$$\text{or } \mathrm{V} = x\sqrt{\frac{g}{l}}.$$

H.D.K.—A horse goes half as fast again downhill as on level ground, and three times as fast downhill as uphill. It took $2\frac{1}{2}$ hours to go from A to B, and $2\frac{1}{4}$ hours to return from B to A by the same road, there being two more miles uphill going than returning, and the level road being $\frac{1}{5}$ of the whole distance. How far was it from A to B?

Since there are two more miles uphill going than returning, there must be two more miles downhill returning than going.

Hence the horse must take $2\frac{1}{2} - 2\frac{1}{4} = \frac{1}{4}$ hour longer in going up these two miles than in going down.

A simple sketch, consisting of a horizontal line for level road, and two sloping lines for up and down, will make this clear.

$$\text{Now, } \frac{\text{time up 2 miles}}{\text{time down 2 miles}} = \frac{3}{1}.$$

$$\therefore \frac{\text{time up} - \text{time down}}{\text{time down}} = \frac{3-1}{1} = \frac{2}{1}.$$

$$\therefore \frac{\frac{1}{4}\text{ hour}}{\text{time down}} = 2.$$

$$\therefore \text{time down 2 miles} = \tfrac{1}{8}\text{ hour},$$

$$\text{and speed downhill} = \frac{2}{\frac{1}{8}} = 16 \text{ miles per hour.}$$

Speed on level $= \frac{2}{3}(16) = 10\frac{2}{3}$ miles per hour, and speed uphill $= 5\frac{1}{3}$ miles per hour.

Now consider the whole double journey, there and back.

Of the whole journey $\frac{1}{5}$ is level, and of the remaining $\frac{4}{5}$ there is just as much uphill as downhill—that is, $\frac{2}{5}$ of the whole journey is up and $\frac{2}{5}$ down.

The time occupied altogether is $4\frac{3}{4}$ hours.

Hence time on level + time up + time down $= 4\frac{3}{4}$.

Instead of "whole distance there and back" write x.

$$\text{Then } \left(\frac{x}{5} \div 10\tfrac{2}{3}\right) + \left(\frac{2}{5}x \div 5\tfrac{1}{3}\right) + \left(\frac{2}{5}x \div 16\right) = 4\tfrac{3}{4}.$$

This gives $x = 40$ miles. The distance from A to B is therefore 20 miles. Ans.

Zadok.—A fisherman has fished ten times, and has caught on an average two fish every time. Show that this might have come about in $\dfrac{\lfloor 29}{\lfloor 20 \,\lfloor 9}$ ways.

The total number of fish caught will be $10 \times 2 = 20$.

If A denote a day, and *a* a fish, then *one* way in which the fish might have been caught may be represented by

A,*a*A*a*A*a*A*a*A*a*AA*a*A*a*A*a*A*a*AA*a*A*a*A*a*A*a*.

This represents the case in which 2 were caught on the first day, 1 on the second, 5 on the third, *none* on the fourth, and so on.

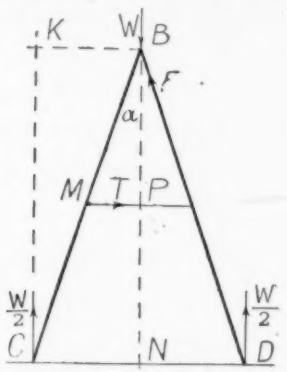
Similarly, A,*a*A*a*A*a*A*a*A*a*A*a*A*a*A*a*A*a*A*a*AAAAAAA would represent the case where all the fish were caught on the first day. Notice that in this method of representing the various ways *we must always have* A *at the beginning*.

Hence we need only consider the other 29 letters, 20 of

which are a and 9 are A, and the problem is to find the number of permutations, taking them *all* at a time.

Using the well-known formula to be found in every text-book dealing with permutations and combinations, the answer is $\frac{\lfloor 29}{\lfloor 20 \, \lfloor 9}$.

W. H. W.—A step-ladder of the form of the letter A, with both its legs inclined at an angle α to the vertical, is placed on a horizontal floor, and is held up by a cord connecting the middle point of its legs, there being no friction anywhere. Prove that when a weight W is placed on the top of the ladder, the tension in the cord is increased by W tan α.



The forces acting on the step-ladder as a whole are the weight W and the vertical reactions at C and D respectively; and since ND = NC, each of the reactions R must be equal to $\frac{W}{2}$.

Now consider the forces acting on the leg BC. At B we have the weight W and a force F (the thrust in the leg DB). At M we have a force T equal to the tension due to W in the cord. At C we have the vertical reaction $R = \frac{W}{2}$.

Since this system is in equilibrium, the algebraical sum of the moments of the forces about any point will be zero.

Take moments about B.

$$\text{Then } \left(\frac{W}{2} \times BK\right) - (T \times BP) = 0.$$

$$\therefore T = W \cdot \frac{BK}{2 \cdot BP} = W\frac{CN}{BN} = W \tan \alpha.$$

(If you specially desire to have this worked out by the "virtual work" method, please write again.)

Our thanks are due to a few correspondents who have criticised the solutions given in answer to the queries sent by "C. Nicholson" and "Bene," which appeared in the March number. We gladly welcome such criticism, and regret that we cannot always insert it in these columns. The following solutions to the above queries have been received:—

C. Nicholson.—For query, see PRACTICAL TEACHER for March. Since the given expression becomes 0 when $a = 0$, a must be a factor. For similar reasons, b and c are each factors; hence abc is a factor. And since every term in the given expression is of the three dimensions only, the remaining factor must be merely a numerical coefficient. Hence the expression reduces to the form $Mabc$, where M is a constant. Since M does not depend on the particular numerical values of a, b, or c, put, say, $a = 1$, $b = 1$, $c = 1$.

Then $M \times 1 \times 1 \times 1 = 3^3 - 1^3 - 1^3 - 1^3 = 24$.

Obviously a solution of this nature was expected by the examiner.

Bene.—For query, see PRACTICAL TEACHER for March. Denoting $ax^3 + bx + c$ by A, and $cx^3 + bx^2 + a$ by B, we observe that any (quadratic) factor common to A and B must be contained in A − B;

that is, in $(a - c)x^3 + bx(1 - x) + c - a$;

" $(a - c)(x^3 - 1) + bx(1 - x)$;

" $(x - 1)[(a - c)(x^2 + x + 1) - bx]$.

But $x - 1$ is *not* a factor common to A and B; hence the only possible common factor is contained in

$$(a - c)x^2 + x(a - c - b) + a - c.$$

Similarly, any factor common to A and B must be contained by A + B; and by working in the above manner, we find that the only possible common factor is contained in

$$(a + c)x^2 - x(a + c - b) + a + c.$$

From this we conclude that

$$x^2 + x\left(\frac{a - c - b}{a - c}\right) + 1 = x^2 - x\left(\frac{a + c - b}{a + c}\right) + 1.$$

This, when simplified, leads to

$$a^2 - ab - c^2 = 0 \quad . \quad . \quad . \quad . \quad . \quad . \quad . \quad (1)$$

The common factor, $x^2 + \frac{a - c - b}{a - c} + 1$, may be expressed as

$$x^2 + \left(1 - \frac{b}{a - c}\right)x + 1,$$

$$\text{or } x^2 + \left(1 - \frac{ab}{a(a - c)}\right)x + 1;$$

that is, $x^2 - \frac{c}{a}x + 1$, by means of (1).

Knowing this to be a factor, it follows that

$$ax^3 + bx + c = (ax + c)\left(x^2 - \frac{c}{a}x + 1\right),$$

$$cx^3 + bx^2 + a = (cx + a)\left(x^2 - \frac{c}{a}x + 1\right).$$

Falstaff.—The length of a rectangular field of five acres is to its breadth as 4 : 3. Find the length to the nearest tenth of a yard. (Scholarship, 1895.)

The area is $5 \times 4840 = 24200$ square yards.

Length : area :: 4 : (4 × 3).

$$\therefore \text{length} = \frac{4 \times \text{area}}{12} = \frac{24200}{3} = 8066{\cdot}66 \text{ yards.}$$

The length to the nearest tenth of a yard is 8066·7 yards.

Edith.—Solve the equation $\cot^{-1}(x - a) + \cot^{-1}(x - b) + \cot^{-1}(x - c) = 0$. (Cambridge Senior, 1900.)

Let $\cot \alpha = (x - a)$, $\cot \beta = (x - b)$, $\cos \gamma = (x - c)$.

Then $\alpha + \beta + \gamma = 0$.

$$\alpha + \beta = -\gamma.$$

$$\cot(\alpha + \beta) = \cot(-\gamma) = -\cot\gamma;$$

$$\text{or } \frac{\cot\alpha\cot\beta - 1}{\cot\alpha + \cot\beta} = -\cot\gamma.$$

$$\frac{(x - a)(x - b) - 1}{(x - a) + (x - b)} = -(x - c).$$

$$(x - a)(x - b) + (x - a)(x - c) + (x - b)(x - c) - 1 = 0.$$

$$3x^2 - 2(a + b + c)x + ab + ac + bc - 1 = 0.$$

Solving this quadratic equation for x in the ordinary way, we get—

$$x = \tfrac{1}{3}[(a + b + c) \pm \sqrt{(a^2 + b^2 + c^2 - ab - ac - bc + 3)}].$$

Ralpho.—Two clocks strike one o'clock together. Supposing one of them to gain 5 minutes while the other gains 3 minutes, and that the quicker one goes through 13 hours when it ought only to have gone 12 hours, find when they will next strike together. (Certificate Exam., 1880.)

Name the quicker clock A, the slower B, and a correct clock C.

A gains 1 hour in 12 of C, or 5 minutes per hour of C.

B will therefore gain 3 minutes per hour of C.

That is, B indicates 63 minutes, while A indicates 65 minutes.

When B has moved 60 minutes, A will have moved

$$\frac{60}{63} \text{ of } 65 = \frac{1300}{21} = 61\tfrac{19}{21} \text{ minutes.}$$

A therefore gains $1\frac{2}{21}$ minutes per hour of B, as registered by their dials.

Before their minute hands can be together again, A must gain 60 minutes on B. This will occur when B has moved over

$$\frac{60}{1\frac{2}{21}} = \frac{60 \times 21}{40} = \frac{63}{2} = 31\tfrac{1}{2} \text{ hours.}$$

Both minute hands then point to the half-hour.

After another $31\frac{1}{2}$ hours the minute hand of A will again have overtaken that of B. B will then in all have moved over 63 hours, and will indicate four o'clock; A will have moved over 65 hours, and will indicate six o'clock; while C will have moved over 60 hours, and will indicate one o'clock.

Ilan.—A garrison of 5000 men is supplied from two reservoirs, into each of which water flows continually at the same uniform

rate. On a certain day on which each reservoir contains the same quantity of water, the garrison begins to draw exclusively from one reservoir, and empties it in 8 days. Eight per cent. of the troops then leave the town, and the remainder then draw exclusively from the other reservoir, and 12 days later 300 more men are sent away. Two days later again, just as the second reservoir is found to be empty, all the men who have left return with 100 more. If both reservoirs are now drawn on, how long will it be before both are empty? (Civil Service, 1900.)

We shall name the first reservoir A, and the second B, and shall express all quantities of water as fractions of the quantity in each reservoir at the beginning.

A is emptied in 8 days by 5000 men. The average amount used by each man per day is therefore $\frac{1}{40000}$.

400 men now leave the town, and for the next 12 days there are 4600 men, who will use from B

$$\frac{12 \times 4600}{40000} = \frac{276}{200}.$$

For the next 2 days there are 4300 men, who will use from B

$$\frac{2 \times 4300}{40000} = \frac{43}{200}.$$

In 14 days, therefore,

$$\frac{276 + 43}{200} = 1\frac{119}{200}$$

water is taken away from B.

But since B is now empty, $\frac{119}{200}$ must have entered B during the past 22 days.

Water must, therefore, enter each reservoir at the rate of $\frac{119}{4400}$ per day.

5100 men now begin to draw from both reservoirs, B being empty, and A containing $\frac{14 \times 119}{4400}$.

Each day $\frac{5100}{40000} = \frac{51}{400}$ will be taken away, and $\frac{2 \times 119}{4400} = \frac{238}{4400}$ will enter the two reservoirs.

The amount contained by the two reservoirs—namely, $\frac{14 \times 119}{4400}$—is being diminished at the rate of $\frac{51}{400} - \frac{238}{4400} = \frac{323}{4400}$ per day.

Both A and B will, therefore, be empty in $\frac{14 \times 119}{4400} \div \frac{323}{4400} = \underline{5\frac{5}{19} \text{ days.}}$

Rivelin.—In the curve

$$e^{\frac{x+y}{a}} - e^{\frac{x}{a}} - e^{\frac{y}{a}} - 1 = 0,$$

if α be the angle which the tangent at the point (x, y) makes with the axis of x, prove that

$$\sec \alpha = \pm \coth\left(\frac{x}{a}\right).$$

(London B.Sc., 1900.)

$$e^{\frac{x}{a}}e^{\frac{y}{a}} - e^{\frac{x}{a}} - e^{\frac{y}{a}} - 1 = 0. \quad \therefore e^{\frac{y}{a}}\left(e^{\frac{x}{a}} - 1\right) = e^{\frac{x}{a}} + 1. \quad \therefore e^{\frac{y}{a}} = \frac{e^{\frac{x}{a}} + 1}{e^{\frac{x}{a}} - 1}.$$

Differentiate with respect to x, and we get—

$$\frac{1}{a}e^{\frac{y}{a}}\frac{dy}{dx} = \frac{\left(e^{\frac{x}{a}} - 1\right)\left(\frac{1}{a}e^{\frac{x}{a}}\right) - \left(e^{\frac{x}{a}} + 1\right)\left(\frac{1}{a}e^{\frac{x}{a}}\right)}{\left(e^{\frac{x}{a}} - 1\right)^2} = \frac{-\frac{2}{a}e^{\frac{x}{a}}}{\left(e^{\frac{x}{a}} - 1\right)^2}.$$

$$\therefore \frac{dy}{dx} = \frac{-2e^{\frac{x}{a}}}{\left(e^{\frac{x}{a}} - 1\right)^2 e^{\frac{x}{a}}} = \frac{-2e^{\frac{x}{a}}\left(e^{\frac{x}{a}} - 1\right)}{\left(e^{\frac{x}{a}} - 1\right)^2\left(e^{\frac{x}{a}} + 1\right)} = \frac{-2e^{\frac{x}{a}}}{e^{\frac{2x}{a}} - 1}.$$

Now $\sec^2 \alpha = 1 + \tan^2 \alpha = 1 + \left(\frac{dy}{dx}\right)^2$

$$= 1 + \frac{4e^{\frac{2x}{a}}}{\left(e^{\frac{2x}{a}} - 1\right)^2} = \frac{e^{\frac{4x}{a}} - 2e^{\frac{2x}{a}} + 1 + 4e^{\frac{2x}{a}}}{\left(e^{\frac{2x}{a}} - 1\right)^2} = \frac{e^{\frac{4x}{a}} + 2e^{\frac{2x}{a}} + 1}{\left(e^{\frac{2x}{a}} - 1\right)^2}$$

$$= \left(\frac{e^{\frac{2x}{a}} + 1}{e^{\frac{2x}{a}} - 1}\right)^2. \quad \therefore \sec \alpha = \pm \frac{e^{\frac{2x}{a}} + 1}{e^{\frac{2x}{a}} - 1}$$

$$= \frac{e^{\frac{x}{a}}\left(e^{\frac{x}{a}} + e^{-\frac{x}{a}}\right)}{e^{\frac{x}{a}}\left(e^{\frac{x}{a}} - e^{-\frac{x}{a}}\right)} = \pm \coth\left(\frac{x}{a}\right).$$

Timothy.—A sphere rests upon a plane, and a point of light is at some point above the plane. Show that the sphere touches the shadow area at a focus. (London B.Sc., 1900.)

The rays of light proceed in straight lines, and the shadow is the section made by the plane of the cone of shade. The cone has its apex at the given point, and touches and encloses the given sphere.

If the point is at a height equal to the diameter of the sphere, the section is a parabola; if at a greater height, either an ellipse or a circle; if at a less height, the section is a hyperbola.

It is proved in text-books dealing with Geometrical Conics that the focus of any conic section is at the point where the sphere, resting on the plane of section and touching the cone internally in a circle, touches the plane of section. (See Wilson, for instance.)

H.S.—A tank 64 ft. long, 22 ft. broad, and 30 ft. deep is full of water, and is emptied in 16 minutes by a pipe whose sectional area is 33 sq. in.; how fast does the water flow in the pipe? (Certificate Exam., Scotland, 1898.)

The tank contains $64 \times 22 \times 30$ cubic ft. of water.

The amount flowing through the pipe *per second* will be

$$\frac{64 \times 22 \times 30}{16 \times 60}.$$

But the volume of water passing through the pipe in 1 second is also $\frac{33}{144}$ × (number of feet travelled by the water in 1 second).

∴ number of feet travelled by the water per second

$$= \frac{64 \times 22 \times 30}{16 \times 60} \div \frac{33}{144};$$

or, speed of water in pipe

$$= \frac{64 \times 22 \times 30 \times 144}{16 \times 60 \times 33} = \underline{192 \text{ ft. per second.}}$$

R.D.—If $x^2 = a^2 + yz$, $y^2 = b^2 + zx$, $z^2 = c^2 + xy$, show that $a^2x + b^2y + c^2z = (a^2 + b^2 + c^2)(x + y + z)$. (C.H.E. Exam., 1898.)

Multiplying by x, y, z respectively, we get—

$$x^3 = a^2x + xyz, \quad \therefore a^2x = x^3 - xyz.$$
$$y^3 = b^2y + xyz, \quad \therefore b^2y = y^3 - xyz.$$
$$z^3 = c^2z + xyz, \quad \therefore c^2z = z^3 - xyz.$$
$$\therefore a^2x + b^2y + c^2z = x^3 + y^3 + z^3 - 3xyz.$$

It is often useful in this type of question to remember that

$$x^3 + y^3 + z^3 - 3xyz = (x + y + z)(x^2 + y^2 + z^2 - xy - xz - yz).$$

Using this, we get—

$$a^2x + b^2y + c^2z = (x + y + z)(x^2 - yz + y^2 - xz + z^2 - xy)$$
$$= \underline{(x + y + z)(a^2 + b^2 + c^2)}.$$

Macrae.—If $x = a^3 - bc$, $y = b^3 - ca$, $z = c^3 - ab$, show that $x^3 + y^3 + z^3 - 3xyz = (a + b + c)^2(a^2 + b^2 + c^2 - bc - ca - ab)^2$. (St. Andrews M.A., 1892.)

$$x^3 + y^3 + z^3 - 3xyz = x(x^2 - yz) + y(y^2 - zx) + z(z^2 - xy). \quad . \quad (1)$$

Now $x^2 - yz = (a^3 - bc)^2 - (b^3 - ca)(c^3 - ab)$
$= a^6 - 2a^3bc + b^2c^2 - (b^3c^3 - c^3a + a^2bc - ab^3)$
$= a^6 - 3abc + c^3a + ab^3$
$= a(a^3 + b^3 + c^3 - 3abc).$

Similarly, $y^2 - zx = b(a^3 + b^3 + c^3 - 3abc)$,
and $z^2 - xy = c(a^3 + b^3 + c^3 - 3abc)$.

The right-hand part of (1) becomes

$$(a^3 + b^3 + c^3 - 3abc)(ax + by + cz)$$
$$= (a^3 + b^3 + c^3 - 3abc)(a^3 - abc + b^3 - abc + c^3 - abc)$$
$$= (a^3 + b^3 + c^3 - 3abc)^2$$
$$= (a + b + c)^2(a^2 + b^2 + c^2 - bc - ca - ab)^2.$$

Ousel may have solution by post.

OUR SCIENCE SECTION

☞ **Subscribers requiring Explanations of Difficulties in any branch of Science, or Advice upon Courses of Study, can obtain all help required by communicating with the Editor, and accompanying their query with the Coupon cut from this Number.**

PHYSIOGRAPHY

(ADVANCED AND HONOURS).

Red Rain.—Professor Judd writes to *Nature* for March 28th, on this interesting subject, as follows:—"The quantity of dust carried over to Europe by winds from the African continent during the present month seems to have been unusually great, for traces of the blood rain are said to have been noticed as far north as Hamburg and Schleswig-Holstein, while in most cases such phenomena are confined to the countries immediately bordering the Mediterranean. My colleague, Professor A. W. Rücker, who has been staying at Taormina in Sicily, has forwarded to me some very interesting observations which he has made on the subject. Writing on March 12, he says, 'We have had a rather curious phenomenon here. The sirocco was blowing, and the hills were wrapped in mist; but the fog assumed a yellow hue, and the sun, which at times could be seen through it, was a bright blue. This was caused, and accompanied, by a very copious fall of red dust. Some which I shook off my hat was quite dry, and on looking at it through a low-power lens all the granules seemed to be spherical, except a very few grains of what looked like quartz. Of course the question was raised whether Etna was ejecting something which corresponded to the Krakatoa dust, but this was negatived by the fact that the Milan papers state that the dust fell also at Naples and Palermo in such quantity that the streets looked red, and the people felt frightened. I scraped some, which I send you, off a marble table.' Under the microscope the dust is seen to be mainly composed of inorganic particles, chips of quartz in small quantities being mingled with minute plates of various miocene and other minerals. There is also a fair admixture of frustules of fresh-water diatomaceæ, entire and in fragments. The number and variety of these diatomaceæ does not appear to be so striking as in some of the celebrated cases described by Ehrenberg, the organisms from which were figured by him in his *Passat Staub und Blut Regen*. There are, however, a very considerable number of species represented in these recent falls. Vague statements have appeared in some of the newspapers as to the number of millions of tons of dust which during the present month have fallen in Italy. The data upon which these statements have been made have not been given, so that the following memoranda by Professor Rücker cannot fail to be of interest to readers of *Nature*." Here follow some calculations, the gist of which is that about 2·2 grams of dust fell per square metre, which works out at 5½ tons per square mile; but, as Professor Rücker says, "to argue as to the fall over so large an area as a square mile is a big interpolation."

The Eclipse of May 28, 1900.—The plates taken by Sir Norman Lockyer's prismatic camera show the same succession of phenomena as in the three previous eclipses, and also that the chromospheric arcs at the moment of contact were of greater length. Sir Norman showed, before the Royal Society, spectra of the chromosphere at different distances from the limit; also plates showing the spectrum rings of the corona, the ring due to the green ray at 5303·7, and two others. In addition, the spectrum of the corona showed a blue ring at 4231, and a violet one at 3987. It was pointed out that the rings are of totally different character from the chromospheric arcs, and have their greatest brightness at places other than where the chromospheric arcs are brightest. Photographs of the corona were also shown by Mr. Howard Payn, taken with a Taylor photo visual lens of 4-inch aperture and 16-feet focus, with five seconds' exposure. In all respects the corona was exactly that of a sun spot minimum. A photograph taken with a Zeiss astigmatic lens of 9-inch focal length, with a Thorp grating mounted in front, the exposure being forty seconds, showed a streamer in the north-east quadrant to a distance of 4½ diameters.

It was stated by Sir Norman Lockyer that the corona was like that of 1878, not only in general form, but also in the minute structure of the inner corona, which was distinctly different from that seen in 1871. Further, there were no bright lines, such as were seen in 1871, in the spectrum of the corona of the present year, or in that of 1878. Shadow bands were very distinctly observed.

Just before the extinction of the photosphere, Dr. Copeland, who was in the same town as Sir Norman's party—namely, Santa Pola—but in a higher situation, observed the well-known "Bailey's Beads." He also testified to the fact that the corona of 1900 presented a striking resemblance to the picture of that of 1878. Viewed about mid-totality in a direct vision prism, the spectrum appeared continuous, the K 1474 ring not being visible. With the 40-feet three successful negatives of the prominences and corona were obtained, with exposures of five, eighteen, and three seconds respectively. While the shorter exposure brought out the shorter streamers well, the best picture thereof was obtained from the longer exposure, wherein the long streamers and a considerable amount of detail in the smaller streamers appear distinctly.

Fraunhofer Lines and the Spectrum of the Corona.—Much importance has rightly been given to the question as to why the Fraunhofer lines are absent from the spectrum of the corona. Professor Wood reminds us that the lines were seen in the eclipse of 1871 by Janssen, that they were photographed in 1882 by Scherter, and that they had been seen on other occasions. He therefore suggests that the failure to observe the lines during the eclipses of 1898 and 1900 may have been due to the use of too high dispersion, and also to the fact that the latest photos are of spectra of portions of the corona extending only a short distance from the sun's limit. The inner corona, it is maintained, is probably incandescent, and therefore sufficiently bright to overshadow the dark lines in places, where the outer corona is projected upon it. The lines should therefore be looked for with spectroscopes of low dispersive power, and at a considerable distance from the limit. In addition, Professor Wood has obtained evidence from experiment that light reflected by small particles in the corona would be deficient in the rays of greater wave length. It is, therefore, probable that the non-observation of the lines is no proof of their non-existence, but is due to the circumstances referred to above.

The Nova in Perseus.—At the meeting of the Royal Astronomical Society on March 8, the Astronomer-Royal gave the following details as to the brightness of the waning stranger:—

Day.	Magnitude.	Day.	Magnitude.
February 25	0·5	March 2	2·1
,, 27	1·8	,, 3	2·2
,, 28	1·75	,, 5	2·7
March 1	2·2	,, 6	3·1
		,, 7	3·2

The Reversing Layer.—Miss Clerke, in *The Journal of the British Astronomical Association*, gives the following summary of later facts as to this question:—"Professor Frost, from a discussion of his photographs taken during the eclipse of May last, concludes that at least 60 per cent. of the stronger dark lines of the solar spectrum are found to be bright in a stratum not exceeding (for the great majority of the lines) one inch, or less than five hundred miles above the photosphere. The chromospheric spectrum can be distinguished from the flash spectrum by the length of the arcs formed by its constituent rays. The variously refrangible rays of hydrogen, helium, and calcium

fringe 100° to 120° of the limit; while one inch lines, and hundreds besides, show us mere hair streaks of brief illumination. But arcs are found of every intermediate length, showing that the reversing layer is continuous with the chromosphere. It is quite clear that the ingredients of the formation are sorted out on some principle strange to our experience. No correspondence can be traced between the length of the arcs and the atomic weights of the substances originating them. Calcium floats higher than hydrogen; titanium, scandium, chromium, strontium, also rise high and shine widely, while substances of greatly inferior density show by an evanescent flash. The absorptive inefficiency of hydrogen is another anomaly. Four, or possibly five, hydrogen lines are dark in the sun; thirty are bright in the chromosphere. Yet every ray from the sun's disc traverses the chromospheric filter. Herr Cantos finds that gases rendered incandescent by electricity fail to exert their due support upon light, and his experiments cannot be ignored in the present connection.

Notanda for May: Eclipse of the Moon.—Two of the four eclipses that the present year will see take place on the 3rd inst., in the shape of a penumbral eclipse of the moon, partly visible at Greenwich, and among which the following facts are noteworthy. First contact with the penumbra at 4 hours 6 minutes of the afternoon; middle of the eclipse, 6 hours 31 minutes; and last contact with the penumbra, 8 hours 55 minutes. Time of moon's rising, 7 hours 28 minutes about.

Eclipse of the Sun.—A total eclipse of the sun, invisible at Greenwich, takes place on Sunday, 18th inst. Begins at 3 a.m., in long. 52° E. and 20° S. lat.; ends at 8 hours 8 minutes a.m., in 145° E. and 6° S. The line of central eclipse passes from south of Madagascar through the Mauritius across the Indian Ocean, through Sumatra, Borneo, Celebes, and southern New Guinea.

Mercury and Venus are evening stars, and may at the end of the month be observed setting about an hour after the sun in the north-west.

Mars is in Leo, not far from Regulus.

Jupiter is a morning star in Sagittarius, low down in the south-east.

Saturn is also in Sagittarius, not far from Jupiter.

Rainfall in May 1900.—Rain fell on nine days. Total fall, 1·32 inch, or 0·68 inch below the average for the last fifty years.

Constellations.—Towards the end of the month Draco, Hercules, and Ophiucus will be in the meridian about midnight.

The star clusters of Hercules may be seen on the 18th with the naked eye between ζ and η Hercules.

For star maps, and directions how to find the remainder of the constellations, etc., see "*Section Two*" *Physiography* (Nelson, 2s.).

CHEMISTRY NOTES.

BY THOMAS CARTWRIGHT, B.A., B.SC. (LOND.),

First Class Honoursman in Chemistry.

Electrolytic Preparation of Alkali Metals from Fused Alkali Chlorides.—Herr Fischer, who has lately given attention to this branch of inorganic chemistry, performed experiments with a mixture of potassium and sodium chlorides in molecular proportions, from which sodium containing about 1 per cent. of potassium is obtained by electrolysis. The anode was of carbon, the cathode of iron, and the cathode current density five to ten ampères per cubic centimetre, the salt being fused by the current itself. The chief source of loss of sodium was found in the circulation set up in the liquid by the evolution of chlorine at the anode. The flow of liquid thus produced carries globules of metal away from the cathode towards the anode, where it recombines with chlorine. After many unsuccessful attempts, this source of loss was almost entirely eliminated by interposing a partition dipping a little below the surface of the bath between the electrodes. The partition consisted of a water-cooled iron tube of rectangular section, covered externally by plates of marble.

Combination of Silver and Oxygen.—Pure silver-foil at a temperature of 500° to 550° C., when in a sealed tube containing dry oxygen, is changed into a yellowish-white powder giving the reaction of argentous oxide (Ag_2O), and is at the same time partly disintegrated. The yellow powder, upon examination, appears to consist of a mixture of the oxide and of finely-divided silver. The same results were obtained by M. Berthelot when air was substituted for oxygen. When moist air or oxygen is employed, the disintegration of the metal is more pronounced, and the absorption of the gas is greater. At 100° C. no alteration of the metal was to be observed, but at 200° C. there was a perceptible alteration. When heated up to 550° in nitrogen, steam, or carbon dioxide, there is no disintegration whatever of the metal.

Plumbic Sulphate—$Pb(SO_4)_2$.—Plumbic sulphate has been prepared by Herrn Elbs and Fischer by the electrolysis of sulphuric acid of specific gravity 1·7 to 1·8 at a temperature not exceeding 30° C., with a current density at the anode of 0·02 to 0·06 ampère per cubic centimetre. The anode is made of lead, and should be immersed in a considerable volume of acid, and separated from the cathode by a porous pot. The salt is partially deposited during the electrolysis, in the form of a mud containing 60 to 85 per cent. of plumbic sulphate. A purer salt is afterwards deposited in indistinct crystals from the anode liquid.

Plumbic sulphate has a faint greenish-yellow shade: 100 cubic centimetres of concentrated sulphuric acid dissolve about 0·345 gram of it at 30°; it reacts with, or is insoluble in, all ordinary solvents. Water decomposes it at once into sulphuric acid and lead peroxide. Sulphuric acid of specific gravity less than 1·65 produces the same change more or less quickly at the ordinary temperature. Concentrated hydrochloric and acetic acid dissolve it, forming lead tetrachloride and lead tetracetate. As an oxidising agent, it resembles, but is more energetic than, lead peroxide. With cold concentrated sodium hydroxide solution a plumbate is formed. Plumbic sulphate forms double salts with the sulphates of the alkali metals, ammonia and amines—such as $K_2Pb(SO_4)_2$ and $(NH_4)_2Pb(SO_4)_2$. These are more stable than the simple salt. They may be prepared by adding the finely-powdered alkali sulphates to the solution of plumbic sulphate in concentrated sulphuric acid, or by electrolysis, with lead anode, of sulphuric acid to which these salts have been added.

The ammonium and potassium salts are yellow, indistinctly crystalline powders, almost insoluble in sulphuric acid of specific gravity 1·7. Towards reagents they conduct themselves exactly as plumbic sulphate does.

The formation of plumbic sulphate explains the rapid disintegration of the positive plates of accumulators when charged with too high currents.

Sulphuric Acid by Catalysis.—The manufacture of sulphuric acid by passing sulphur dioxide over spongy or finely-divided platinum is well known in the laboratory. It is now being introduced into the factory in both Belgium and Germany. This method of manufacture guarantees the production of an acid absolutely free from arsenic; and it is not unlikely that the production of aliments by the aid of oil of vitriol may popularise this more expensive method, especially since the beer scare.

The Mode of Procedure.—If the temperature be kept uniform, then the catalytic agents (alloys of platinum) are of varying degrees of richness—the mixed gases being first brought into contact with, say, a 5 per cent. platinum alloy, then with a 40 per cent. alloy, and finally with a 10 per cent. alloy. By this means the reaction, which easily becomes a reversible one, is kept constant. Or catalytic bodies of uniform richness may be used, and the variation may be in the temperature: thus the reaction may begin at 300° C. and advance to 500° C., and then decline to 400° C., the result being the same as when the catalytic agent varied in richness.

Carbides of Calcium and Silicon as Reducing Agents.—Special attention is being paid to these reducing agents in respect to their action upon metallic oxides, ores, and salts. Herr Neumann finds that chlorides are more easily reduced by calcium carbide. They must be quite dry, and are mixed with oxide so that the reaction is—

$$2M_2O + 2MCl + CaC_2 = 6M + CaCl_2 + 2CO,$$

where M stands for a monad metal.

Sodium chloride, or, better still, a mixture of sodium and potassium chlorides, may be added as a flux. Copper, lead, and nickel can be obtained in a button; other metals remain in small scattered globules, whilst others to a large extent volatilise.

Sulphates, mixed with oxides, can be reduced according to the equation—

$$M_2SO_4 + 2M_2O + CaC_2 = 6M + CaSO_4 + 2CO.$$

In the absence of oxide, a sulphide is formed.

Carbonates are reduced according to the equation—

$$M_2CO_3 + 2M_2O + CaC_2 = 6M + CaCO_3 + 2CO.$$

Oxides and roasted ores can in many cases be reduced, but in others this is impossible. The reaction is—

$$3M_2O + CaC_2 = CaO + 6M + 2CO.$$

The reduction Herr Neumann effected in a clay crucible heated in a gas furnace. The method is at present too expensive to find general application on the manufacturing scale. In the case of the rarer metals, where the cost of reduction is of less importance, the aluminium method is preferable, as it is neater, and requires no external heat.

Carborundum (silicon carbide) also reduces metallic oxides, but sodium carbonate must be added as a flux.

CLOUGH'S CORRESPONDENCE COLLEGE.

P.T. CLASSES,

OCTOBER 1901.
APRIL 1902.

Names of Pupil Teachers who are preparing for the Examination in **October 1901** should be entered without delay.

New Classes for **April 1902** have now commenced.

Prospectus, Syllabus, and full particulars free on application.

SCHOLARSHIP,

DECEMBER 1901.

New Classes for **December 1901** are now commencing. To secure admission immediate application is necessary.

£700

in Scholarships and Exhibitions for Successful Students.

For full particulars see Prospectus.

CERTIFICATE,

JULY 1902.

For best tuition join **Clough's Highly Successful Certificate Class.**

New Class commences first week in May.

Intending Students should make immediate application.

For Prospectus, Plan, Terms, Entry Form, and full particulars of the above Classes, address—

Mr. G. B. CLOUGH, Temple Chambers, London, E.C.

FOR CERTIFICATE STUDENTS, 1902.

In the Press.] [*Ready Shortly.*

CLOUGH'S HISTORY OF EUROPE

(1814-1848).

With Coloured Maps, Plans, and full Summaries of Important Events.

Uniform in style and treatment with "Clough's Certificate History" (1789-1815).

Crown 8vo, well bound in cloth. Price **3s. 6d.**

The only Book in the Market specially written to meet the requirements of Candidates at the **Certificate Examination, 1902.**

Special Appendices deal with the Industrial and Commercial History of the Period, Biographies of all Important Personages, and the Treaty Changes in the Map of Europe.

The Historical Geography of Europe has been treated in special detail throughout, and all Territorial Changes are illustrated by Maps.

No Certificate Student can afford to do without this Book.

A List of Special Books for P.T.'s, Scholarship, and Certificate Students will be sent immediately on application.

Of all Booksellers, or post free, at Published Price, from

RALPH, HOLLAND, & CO., Educational Publishers,

69 Temple Chambers, London, E.C.

$Ca(ClO_3)_2$ by Electrolysis.—The electrolysis of aqueous calcium chloride gives rise to a mixture of calcium chlorate and hypochlorite in proportions depending on the conditions; hence experiments are being made to determine the conditions most favourable to the formation of chlorate. Messrs. Tacher and Moody find that the best concentration appears to be approximately 20 per cent. with horizontal platinum electrodes ten centimetres apart; platinum is the only metal capable of withstanding the action. The electrodes should be of the same size, with a current density of eight ampères per square dm.; the best temperature is 80°. The addition of sodium dichromate or hydroxide is advantageous under certain conditions. After the electrolysis has proceeded for about fourteen hours, there is an appreciable drop in the efficiency, but this is not so great as to seriously interfere with the working value of the process, the efficiency after the forty-ninth hour being 76 per cent.

Action of Ag on Cl in the Light and in the Dark.—Red light does not facilitate the union of chlorine and silver, but blue and violet light favour the combination, although in the latter cases reduction is also favoured.

Light which has traversed a sufficiently thick layer of chlorine behaves very similarly to red light. The result depends largely on whether the chlorine used for filtering the light is dry or moist. If dry, the action is pretty much the same as when white light is used; but if the light is passed through moist chlorine, a considerable diminution in the activity of combination is noticeable. The difference is even greater if a little hydrogen is added to the moist chlorine. Röntgen rays have no perceptible influence on the combination of chlorine and silver.

Methane in Air.—Methane is evolved in abundance from the surface of the earth. Independently of the sources of this gas, which exist in all countries, this carbide is a constant product of the fermentation of substances containing cellulose. M. V. Urbain's researches go to show that plants play the same part towards methane as they do towards carbon dioxide. This he proves by sealing plants hermetically in glass vessels containing about 1,300 cubic centimetres of air, together with known volumes of methane, and by examining the methane left undecomposed at the end of different periods of time.

ELECTRICITY AND MAGNETISM.

ADVANCED AND HONOURS STAGES.

BY EDWIN EDSER, A.R.C.S., F.PH.S.

In the present article and that of next month; short answers will be given to a number of characteristic questions, in connection with those properties of current electricity discussed in preceding articles, which have been set by the Science and Art Department (now the Board of Education) in their advanced examinations within the last ten years. The answers in many cases are much shorter than should be given in an examination, owing to the limited space at my disposal. Intermediate steps in solutions, which can easily be supplied by the student, are for this reason omitted. Diagrams, which are omitted in many of these answers, should always be given in examinations. The student is also referred to answer to "Redder's" query, PRACTICAL TEACHER for March, p. 480, for solution of a difficult problem set in 1900 examination.

1. Heat is generated in a wire of resistance 10 ohms, which forms part of a circuit containing a battery, and having a resistance of 25 ohms. Find the resistance of a shunt which, when applied to the extremities of the wire, will cause the heat generated in it per second to diminish in the ratio 4 to 1, assuming that the resistance of the wire does not alter sensibly with the temperature. (Advanced Day, 1899.)

Heat produced per second in wire $= C^2R$, where C is current flowing through it, and R is its resistance. Hence, for rate of production of heat to be reduced in ratio 4 to 1, current must be halved. Also, since P.D. between ends of wire $= CR$, this will also be halved. Let R′ be the equivalent resistance of the 10 ohms wire shunted with a wire of unknown resistance, S. Then, if E = E.M.F. of cell in circuit, original fall of potential between ends of R 10 ohms resistance $= \frac{10}{25}E$. After shunting, fall of potential between extremities of R′

$$= E\frac{R'}{R' + (25 - 10)} = E\frac{R'}{R' + 15} = \tfrac{1}{2}\frac{10E}{25},$$

as proved above. Dividing through by E, we get

$$\frac{R'}{R' + 15} = \frac{10}{50} = \frac{1}{5}. \quad \therefore R' = 3{\cdot}75.$$

$$\text{Also, } \frac{1}{R'} = \frac{1}{3{\cdot}75} = \frac{1}{10} + \frac{1}{S}. \quad \therefore S = 6 \text{ ohms.}$$

2. Twelve wires of equal length and electrical resistance are arranged to form the edges of a cube, and a current of 4 centiampères is led into the cube at one corner and out at the opposite corner. Find the difference of potential between these two corners, and the effective resistance of the framework between them, the resistance of each wire being 6 ohms. (Advanced, 1898.)

On entering the cube at A (Fig. 1), the current of four centiampères will divide itself equally between the three conductors ending there, each one carrying $\frac{4}{3}$ centiampères. The current flowing from A to B, on reaching the corner B of the cube, will divide equally between BE and BG, each of these carrying $\frac{2}{3}$ centiampère. Similarly, the current of $\frac{4}{3}$ centiampère, flowing along AC,

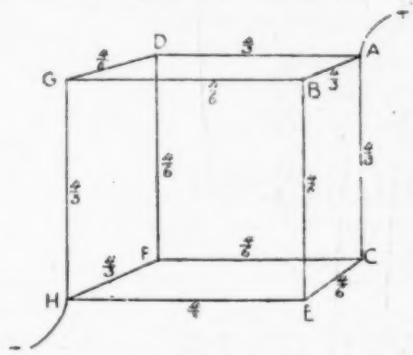


Fig. 1.

will divide itself equally at C—$\frac{2}{3}$ centiampère flowing along CE, and $\frac{2}{3}$ along CF. The currents of $\frac{2}{3}$ flowing along BE and $\frac{2}{3}$ along CE will recombine at E, so that $\frac{4}{3}$ centiampère flows along EH. Similarly, $\frac{2}{3}$ centiampère will flow along FH and GH. The student should have no difficulty in verifying the currents marked on each of the remaining conductors in Fig. 1.

To find the P.D. between A and H, we must follow any path, such as ABEH, and find the sum of the P.D.'s in the various conductors traversed. Remembering that P.D. = current × resistance, we have—

$$\text{P.D. along ABEH} = \frac{\cdot 04}{3} \times 6 + \frac{\cdot 04}{6} \times 6 + \frac{\cdot 04}{3} \times 6 = \cdot 20 \text{ volt.}$$

Let R be the effective resistance of the framework between A and H. Then

$$\cdot 04 \times R = \cdot 20. \quad \therefore R = \frac{\cdot 20}{\cdot 04} = 5 \text{ ohms.}$$

3. The positive poles A and B of a Grove and a Daniell cell are joined by a wire of 0·3 ohm resistance, and the negative poles C and D by a wire of 0·5 ohm. What is the difference of potential between the middle points of AB and CD?

Grove cell:—Int. resistance = 0·2 ohm, E.M.F. = 1·8 volts.
Daniell cell:— ,, ,, = 0·4 ohm, ,, = 1·1 volts.
(Advanced, 1898.)

Since the two cells tend to produce currents in opposite directions round the circuit, the effective E.M.F. in circuit

$$= 1{\cdot}8 - 1{\cdot}1 = \cdot 7 \text{ volt.}$$

$$\text{Total resistance of circuit} = 0{\cdot}2 + 0{\cdot}3 + 0{\cdot}4 + 0{\cdot}5 = 1{\cdot}4 \text{ ohms.}$$

$$\therefore \text{ current in circuit} = \frac{\cdot 7}{1{\cdot}4} = \cdot 5 \text{ ampère.}$$

Following the current from middle point of AB, through Daniell cell, to middle point of CD, we get—

$$\text{P.D.} = \cdot 5 \times 0{\cdot}15 + \cdot 5 \times 0{\cdot}4 + 1{\cdot}1 + \cdot 5 \times 0{\cdot}25 = 1{\cdot}5 \text{ volts.}$$

4. A wire AB of 0·33 ohm resistance forms part of a circuit through which an electric current flows in the direction from A to B. The points A and B are also connected by another conducting path, in which is included a cell of E.M.F. 1·287 volts, and a galvanometer, the positive pole of the cell being that joined to A. If the galvanometer is not deflected, what is the strength of the current in the wire AB? (Advanced, 1897.)

If the galvanometer is not deflected, the fall of potential, due to the flow of the current C along AB, must be just equal to the E.M.F. of the cell. Hence

$$C \times 0{\cdot}33 = 1{\cdot}287.$$

$$\therefore C = \frac{1{\cdot}287}{\cdot 33} = 3{\cdot}9 \text{ ampères.}$$

ALLMAN AND SON, Limited.

Public School Magazine.—"Every teacher of handwriting should see a copy for himself."

THE PUBLIC SCHOOL WRITING BOOK.

This Series has been approved by the - - -

Bank of England.
Bank of Ireland.
Wellington College.
Christ's Hospital.
Parmiter School.
Blundell's School, Tiverton.
Royal Grammar School, Sheffield.
Eastman's Royal Naval Academy.
Leeds Modern School.
Archbishop Holgate's School, York.
King's School, Rochester.
Thanet College, Margate.
Hymer's College, Hull.
Truro Grammar School.
Training College, Derby.
King Edward's Grammar School, Stratford-on-Avon.
Ripley Hospital, Lancaster.

And many others.

QUOTATIONS from the letters of Head and Assistant Masters:—

"Clear and beautiful headline."
"Fine quality of the paper."
"Very superior to any copy book known to me."
"An improvement on any copy book that I have previously seen."
"Most attractive."
"Much pleased to see the return to what I must call the correct form of writing."
"The excellence of the engraving."
"Decidedly good."
"Admirable in design and execution."

The School World.—"We heartily recommend the style of penmanship adopted. It is clear, elegant, and simple. They (the copy books) are sure to command immediate success."

SPECIMENS with Prospectus will be sent to any Secondary School where the Series has not yet been adopted.

Text Books suitable for Oxford, Cambridge, and College of Preceptors' Examinations, 1901.

KING HENRY V.

Edited, with Introduction and Notes, by J. Lees, B.A., Assistant Master Aske's Hatcham School. Price **1s.**, crown 8vo, cloth.

QUESTIONS on "King Henry V."

By J. Lees, B.A., author of "Questions on 'As You Like It.'" Price **2s. 6d.**, crown 8vo, cloth. Interleaved with plain paper.

Extracts from Reviews of Mr. Lees's "Questions on 'As You Like It.'"

Literature.—"For a critical and detailed study of the play, scene by scene, this book is very useful, not only for examination purposes, but as a guide to teachers."
Practical Teacher.—"It would probably be difficult to set a question on this play which Mr. Lees has not in some way anticipated."

CHEMISTRY FOR EXAMINATIONS.

By H. W. Hill, First Class Honours London Inter. B.Sc., and qualified for the Exhibition. Price **2s. 6d.**, crown 8vo, cloth.

Literature.—"This book should serve its purpose, for, without being a 'cram-book' in a bad sense, it contains a *large number of facts, expressed in the briefest manner possible.* Special attention is bestowed on points which experience shows examinees *are particularly liable to forget or misunderstand.*"
Scotsman.—"A useful book for students."
Westminster Review.—"We have received a very useful little book by Mr. H. W. Hill, in which some of the chief stumbling-blocks of the student of chemistry are explained. Special attention has been given by the author to the calculations arising out of the analytical operations of the laboratory."

PRACTICAL BOOK-KEEPING.

By W. D. Oldham, Chartered Accountant, and W. E. Holland, Incorporated Accountant, Instructor of Book-keeping at the Borough of West Ham Municipal Technical Institute. Part I., price **2s.**, crown 8vo, cloth; Part II., price **3s.**, crown 8vo, cloth. Specimen Copies to Headmasters at half-price.

London Chamber of Commerce Journal.—"A practical text-book for students *preparing for examinations*, as well as for general use."
City Press.—"Instructive and most helpful."
Accountant.—"Deals adequately with the elementary or theoretical branch of the subject."

THE METRIC SYSTEM.

By S. Jackson, M.A. Oxon., formerly Headmaster Victoria College, Congleton. Price **1s.**, crown 8vo, cloth.

London Chamber of Commerce Journal.—"A clear and concise treatment of the principles of the Metric System, with ample examples. The work throughout is carefully compiled and well produced. We can confidently recommend this book."
Scotsman.—"Practically an 'Arithmetic' (Metric), clearly expounded, well graded, and *well stocked with problems and examples*....It is a capital book for any one beginning the *practical study* of its subjects."

THE OLD TESTAMENT HISTORY.

For Young Students. By Rev. C. J. Hamer, Vicar, St. Paul's, Newcastle-on-Tyne; with a Preface by the Lord Bishop of Ripon. Price **1s.**, crown 8vo, cloth.

Literature.—"Simply told, and seems well suited to its purpose."
Scotsman.—"Many young, and probably many old, students will appreciate the service done."
G. Hayward, Inspector of Schools, Sunnymeade, Bideford.—"It seems a capital book for use in schools, and should be a successful publication."

EXCERPTS from FRENCH AUTHORS.

Compiled by Henri Blouet, B.A. New Edition, with Vocabulary, thoroughly revised. Price **1s.**, crown 8vo, cloth.

Scotsman.—"An unusually interesting compilation."
Literature.—"Will be a welcome relief from the selections from classical writers."

PREPARATORY GERMAN LESSONS.

By S. E. Bally, Modern Language Master, Manchester Grammar School. Price **9d.**, foolscap 8vo. Consists only of the very elementary German lessons necessary for beginners. Interlinear Reading Lessons. Bold, clear type.

DUAL GERMAN READER.

By Oliver Jones, B.A., Assistant Master Peter Symond's School, Winchester. Price **1s.**, crown 8vo, cloth. Prepared on the same lines as the Dual French Readers by Henri Blouet, B.A.

Full Catalogue post free on application.

London: ALLMAN & SON, Ltd., 67 New Oxford Street, W.

5. Part of the circuit of an electric current consists of a bare wire which passes through a vertical glass tube corked at the lower end. Explain the effect on the temperature of the wire, and on the current in the circuit, of gradually filling the tube with mercury. (Advanced, 1897.)

On gradually filling the tube with mercury, the conductivity of the circuit is increased, since the immersed part of the wire will be cooled, and also part of the current C can flow through the mercury in parallel with the immersed part of the wire. Hence the current C in the circuit is increased. The rate of production of heat in the unimmersed part of the wire will be increased, since C^2R will be increased—R being the resistance of the unimmersed part of the wire.

6. It is found that the current in a given circuit is lowered by the inclusion in it of a certain cell. Show that even if the poles of the cell were connected by a wire of no resistance, it would be unable to generate a current as large as that originally in the circuit. (Advanced, 1897.)

Let E = E.M.F. originally in circuit.
R = original resistance of circuit.
C = original current in circuit.
$\therefore \frac{E}{R} = C.$

Let e = E.M.F., and let r = resistance, of cell afterwards included. If this cell were short-circuited, the current c produced would be equal to $\frac{e}{r}$.

Let C′ = the current in the circuit after the inclusion of the additional cell. Then C > C′.

$$\text{Also, } \frac{E+e}{R+r} = C'. \quad \therefore E + e = (R + r)C'.$$

$$\therefore \frac{e}{r} = \frac{R+r}{r}C' - \frac{E}{r} = \left(\frac{R}{r} + 1\right)C' - \frac{R}{r}C = C' - \frac{R}{r}(C - C').$$

Hence c, which is equal to $\frac{e}{r}$, will be less than C′, which, in its turn, was less than C, the original current in the circuit.

(To be continued.)

THEORETICAL MECHANICS.

ADVANCED AND HONOURS STAGES.

BY F. CASTLE, M.I.M.E.,

Royal College of Science; Lecturer on Mechanics, Geometry, etc., Morley College, London; Author of "Elementary Practical Physics," etc.

We may perhaps, with advantage, draw attention to the use of mathematical instruments, and point out that it is advisable, wherever possible, to draw a figure to scale from the given data, and to use it to obtain numerical results. Even in those cases where results are obtained by calculation, a graphic check can usually be easily carried out, and furnishes a ready means of verifying results. In addition, a carefully-drawn figure, even if it does not furnish a solution, may, and often does, suggest the shortest method to obtain it.

The instruments required are a pair of pencil compasses, a pair of dividers, a good boxwood scale, a protractor, and a pair of set-squares. A simple familiar example occurs when two or more forces acting at a point are given. The resultant may be obtained by calculation, or by drawing lines to a convenient scale to denote the magnitudes and the angles set out by a protractor. Finally, the magnitude and direction of the resultant may be found by using the scale and protractor. The same remarks apply to other portions of statics, resolution of forces, etc.

The formulæ in dynamics should be so well known that it will be an easy matter to obtain numerical values from given data. It will be of some assistance to note the analogies between linear and angular motion. Thus, in linear motion we have the relations—

Acceleration = force ÷ mass.
Momentum = mass × velocity.
Energy = ½ mass × (velocity)².

The corresponding relations in angular motion are—

Angular acceleration = moment of force ÷ moment of inertia.
Moment of momentum = angular velocity × momentum of inertia.
Energy = ½ moment of inertia × (angular velocity)².

It is obviously necessary, in the application of dynamical formulæ, to ascertain that the formulæ used are applicable to the given data. We may illustrate this by considering the three equations of motion—

$$v = V \pm ft, \quad \ldots \quad (1)$$
$$s = Vt \pm \tfrac{1}{2}ft^2, \quad \ldots \quad (2)$$
$$v^2 = V^2 \pm 2fs, \quad \ldots \quad (3)$$

where V denotes initial velocity, f the acceleration, and v and s the velocity and space respectively at a time t.

In each equation uniform acceleration is assumed, and therefore constant force from the fundamental relation—Force = mass × f. Hence care is necessary when the acting force is variable.

The following examples will illustrate what is meant:—

Ex. 1. A perfectly uniform thread or chain is placed on a smooth horizontal table so that one end just hangs over, and consequently that end falls, dragging the rest of the thread after it. Find (*a*) the acceleration of the velocity at the instant when an assigned length is hanging; (*b*) the work that has been done by gravity up to that instant; (*c*) the velocity of the thread at that instant. (1897.)

Here we may denote the mass of unit length of chain by m. Then, if the length of the chain is l, its mass is ml.

(*a*) Let x denote the assigned length which is at the given instant moving with an acceleration f and a velocity V.

$$\text{Then } f = \frac{\text{acting force}}{\text{mass moved}} = \frac{mx}{ml}g = \frac{xg}{l}.$$

(*b*) Work done by gravity is obviously equal to the amount which would have to be done against gravity to raise the chain to its initial position, and is therefore

$$mgx \times \tfrac{1}{2}x = \frac{mgx^2}{2}.$$

To find the velocity at the given instant, we note that the force acting on the chain varies with every small portion which reaches the edge and commences to descend, and we may therefore use the equation of energy, remembering that at the instant the chain began to descend the kinetic energy was zero, and the gain in kinetic energy at any instant is equal to the loss of potential energy.

$$\text{Hence } \tfrac{1}{2}ml\mathrm{V}^2 - mgx \times \frac{x}{2} = 0.$$

$$\therefore \mathrm{V}^2 = x^2\frac{g}{l},$$

$$\text{or } \mathrm{V} = x\sqrt{\frac{g}{l}}.$$

We may obtain the same result by a simple application of the calculus.

$$\text{Thus, } \frac{d\mathrm{V}}{dt} = \frac{xg}{l}. \quad \ldots \quad (1)$$

But the acceleration

$$\frac{d\mathrm{V}}{dt} = \frac{d\mathrm{V}}{dx}\frac{dx}{dt}, \text{ where } \frac{dx}{dt} = \mathrm{V}.$$

Hence from (1) we get

$$\mathrm{V}\frac{d\mathrm{V}}{dx} = \frac{gx}{l}.$$

Integrating, we have

$$\frac{\mathrm{V}^2}{2} = \frac{gx^2}{2l} + \mathrm{C},$$

where C is a constant.

The value of C is 0, because when $x = 0$, V = 0.

$$\therefore \mathrm{V}^2 = \frac{gx^2}{l},$$

$$\text{or } \mathrm{V} = x\sqrt{\frac{g}{l}}.$$

Contrast the result with what would have been obtained by assuming a constant force mxg to act on a mass ml. Then the acceleration would be as before, $\frac{gx}{l}$; but the value of V would be, from (3),

$$\mathrm{V}^2 = 2fs = \frac{2 \times gx}{l} \times x = x\sqrt{\frac{2g}{l}}.$$

(To be continued.)

FOR THE MAY EXAMINATIONS.

Solutions to Test Questions in the

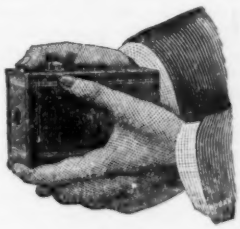
NEW PERSPECTIVE

appear in "The Practical Teacher's Art Monthly."

Price Threepence.

An Efficient Five Shilling Film Camera!

THE BROWNIE.



PRICE 5s. ONLY.

With Spool of 6 Film, 5s. 7d.

Complete post free, 5s. 11d.

Despite its low price and small size, the Brownie Camera is not a toy. It takes splendid photographs 2¼ inches by 2¼ inches, and is loaded and unloaded in daylight. Ask for leaflet describing the Brownie, and mention this paper. Kodaks from 5s. to £7, 7s. Catalogue free.

PRICE 5/- ONLY.

Or with Spool of Film for 6 Exposures, 5s. 7d. Post free 4d. extra.

Of all Photographic Dealers, or of

KODAK, Limited,

43 Clerkenwell Road, E.C., 60 Cheapside, E.C., 171 Regent Street, W., 115 Oxford Street, W., and 59 Brompton Road, S.W.; Also at 96 Bold Street, Liverpool, and 72-74 Buchanan Street, Glasgow.

The BURLINGTON CLASSES.

27 CHANCERY LANE, W.C.

Principal: Mr. J. CHARLESTON, B.A. (Honours, Oxon.; and Lond.).

TUTORS.

The Staff includes a number of graduates of Oxford, Cambridge, London, and Royal Universities, Scholars, Prizemen, etc.

PREPARATION BY CORRESPONDENCE

FOR

MATRICULATION,

B.A., B.Sc.

(London University, Royal University, Dublin University),

L.L.A.

(Degree for Ladies, St. Andrews),

A.C.P., L.C.P., F.C.P.

Oxford and Cambridge Locals.

On a thoroughly individual system, which insures to each student the closest care and attention. Weak subjects receive special help. Fees may be based on success.

Single subjects may be taken—Latin, Greek, French, German, Italian, Mathematics, Mechanics, Physics, Chemistry, Logic, Psychology, Political Economy, etc.

Address: Mr. J. CHARLESTON, B.A.,
The Burlington Classes,
27 Chancery Lane, LONDON.

In the Press.

N.U.T. EDITION

BY

J. H. YOXALL, M.A.,

AND

T. A. ORGAN, B.A.

1901—CODE—1902.

Orders should be placed at once with

The Educational Supply Association,

42A HOLBORN VIADUCT, E.C.

Price 1s. (nett).

Post free, 1s. 3d.

OUR COMPETITION PAGE

OUR FRENCH PRIZE COMPETITION.

Prize Editor—W. T. THOMPSON, B.A. (LOND.), *French and German Honours.*

Important to Scholarship, Certificate, and London Matriculation Students.

WE should like to specially direct the attention of our readers to the fact that the Board of Education, in the Syllabuses for the Scholarship and Certificate Examinations 1901 and 1902, requires "no set books" for French and German. Students preparing for these examinations, as well as students for London Matriculation, could not do better than attempt month by month the pieces set for translation here. They are from the best authors, and of varied character. A competitor who does not gain a prize can derive considerable benefit from the exercise. A study of the successful competitor's translation, and of our remarks, will help him to see where he might have done better. If desired, his paper can be returned (fully corrected) by enclosing six stamps together with a stamped and addressed envelope.—ED.

RULES.

1. All translations should be **posted not later than May 8**, and addressed:—*Prize Editor*, Office of THE PRACTICAL TEACHER, 35 and 36 Paternoster Row, London, E.C.
2. Competitors should cut out and send the Coupon which appears on the Back Wrapper page of the current number.
3. Competitors should adopt a pseudonym, and send name and address written on a separate piece of paper.
4. No competitor may take the prize offered more than once in three months.

FRENCH PRIZE COMPETITION.

A Prize of One Guinea will be given for the best translation into English of the following extract:—

Ce n'est pas le crime que nous craignons, c'est le déshonneur; et pourvu que l'opinion écarte la honte, ou même y substitue la gloire, comme elle en est bien la maîtresse, nous commettons le crime hardiment, et l'homme ainsi disposé s'appelle sans façon *juste*, ou tout au moins *honnête homme*; et qui sait s'il ne remercie pas Dieu *de n'être pas comme un de ceux-là?* C'est un délire dont la moindre réflexion doit nous faire rougir. Ce fut sans doute avec une profonde sagesse que les Romains appelèrent du même nom la *force* et la *vertu*. Il n'y a en effet point de vertu proprement dite, sans victoire sur nous-mêmes, et tout ce qui ne nous coûte rien, ne vaut rien. Otons de nos misérables vertus ce que nous devons au tempérament, à l'honneur, à l'orgueil, à l'impuissance, et aux circonstances; que nous restera-t-il? Hélas! bien peu de chose. Je ne crains pas de vous le confesser; jamais je ne médite cet épouvantable sujet sans être tenté de me jeter à terre comme un coupable qui demande grâce; sans accepter d'avance tous les maux qui pourraient tomber sur ma tête, comme une légère compensation de la dette immense que j'ai contractée envers l'éternelle justice. Cependant vous ne sauriez croire combien de gens, dans ma vie, m'ont dit que j'étais *un fort honnête homme.*

JOSEPH DE MAISTRE.

RESULT OF THE APRIL COMPETITION.

French.

The prize is awarded to "Oakover," the pseudonym of Mr. F. C. Webb, Oakover, Burnham, Somerset.

First Class.—Bergère, Lesley, C.E.M., Nouveau Venu, Kerboga, Onslow Rode, Willow pattern, Cassiopeia, Polly, Paddy, Réséda, Ivy leaf, Hélène, Une débutante, Antiquary, Débutante, Petit oiseau, Cigale, Ernemont, Clachnacuddin, Hungary, A.K., Quædam, Agaznog, Perce-neige, Stretton, Leilani, La printanière, Chemineau, Bleak House, Map, Erimus, A plain woman, Undine, Tatters, Johannes, Vita brevis, Veilchen, Kettering, Eillen, Petite, Briton, Ruddigore, Rioghail, Emilie (W. Dulwich), White Heather (Dunfermline), Vincit, Sordello, Floreffe, Nortoniensis, Skoola, Alectrice, Cat's eye, Nelvil, Integer, Southern Cross, Longchamp, Bull-dog, Sinclair, Pratique, Woodardian, Dinner-time, Helen of Troy, La petite, Antonio (Birkenhead), Tottenham Hotspur, Ci-devant, Peakite, Yebba, Nettie, Mercia, Ellan Vannin, De Wet, Vir summæ sapientiæ.

Second Class.—Centaur, Un rustaud, Discipulus, Fraoch Dearg, Leon, Magdalena, Ariadne, Hold fast, Jamie Soutar, Irénée, Blythswood, ——, E.B.C.R.L., Chez nous, Sheila, Loll, A.C.V., Alico, Mignon, F.D., Neptune, N'importe, Llanroc, Rosine, Victor Hugo, Silly Suffolk, Mentalia, Antonio (Guernsey), Jemima Jane, Winter, Cornucopia, Bouring, Marcus, Nil Desperandum, Adolescens, Ricordo, T.T., Excelsior, Psyche, Gitano, Marguerite, E. St. Martin, Brutus, Mimosa, Morganwg, Meg Phillips, P.T.A.M., Primrose, Emilie (Southwark), Dum spiro spero.

Third Class.—West, Pause, Patricia, Ormuz, Salop.

Disqualified.—Rule 2: Bella, White Heather, Arrière pensée.

Report.

Not a few of the competitors found the long sentence commencing *La dynastie actuelle* a little difficult to manage, and were not careful to keep the antecedent of *que* as close to it as possible. In most cases *préfecture* and *sous-préfecture* were translated too literally. The author, in writing for his own countrymen, naturally uses terms which will best convey his idea to them. In translating into English, either the English terms which most nearly correspond, or general terms, should be used. As usual, the batch of papers I have revised affords clear proof that the reading of many competitors is far too limited. For example, *lâches* is translated "cowardly," *lettrés sans place* as "educated loiterers," "homeless literates," "letters without place," etc.; and *endroit*, in the phrase *à l'endroit de*, is translated literally.

French Prize Translation.

China is a kind of amorphous state, the various elements of which are bound together by ties but imperfectly known to us, but which are sufficiently loose. The chief cohesive force lies in tradition and in the constitution of the ruling class of the literati, or mandarins, recruited as it is throughout the empire from the very heart of the people. On the other hand, fertile seeds of disaffection exist. The reigning dynasty is a foreign dynasty, which the terrible Tai-Ping rebellion in the middle of the century—a rebellion only suppressed by European aid—came within an ace of destroying; and some descendants of the old national Ming dynasty are still alive. Beyond this, according to Chinese notions the present emperor's accession to the throne is tainted by irregularity; and the country is honeycombed by secret societies, a large number of them having for end the overthrow of the established order. No doubt the people generally are profoundly indifferent to politics; they would seldom show hostility even to foreigners, however lacking in prudence these might be, were they not urged on by fanatical or discontented mandarins; but to these sowers of discord they nevertheless yield ready obedience. Now in every divisional chief town, in every district or sub-district, a crowd of soured and starveling out-of-office mandarins are always to be found, following oftentimes the humblest of callings for a livelihood, sharing the common life of the people, but profoundly respected by them, and ever ready to stir up ill-feeling against the Europeans and whatever pertains to them.

OAKOVER.

RELFE BROTHERS' PUBLICATIONS.

Geographical Text Book. By W. B. IRVINE, B.A., Rector of the Morgan Academy, Dundee. Illustrated by Twelve Maps. Eleventh Edition. 4to, 1s.

Also by the same Author.

British Possessions and Colonies. Illustrated by Twelve Maps. 4to, 1s.

"A combination of Atlas and Geography. The maps are clear, the print good, and the subjects well treated. The arrangement is calculated to impress upon the eye the principal facts."—*Secondary Education.*

Relfe Brothers' New Preparatory Atlas. Just published. Quite up to date. Contains Twenty-four *very clear* and beautifully coloured Maps. 4to, 6d.

"The maps are all up to date, so that we can safely recommend this little book to those who want a good, cheap, and reliable atlas to place in the hands of their pupils."—*The Irish Teachers' Journal.*

"Well and clearly coloured, and not overcrowded with names."—*The Practical Teacher.*

Geographical Questions. By J. WULFSON. Specially adapted for Examinations in Commercial Geography. Crown 8vo, 6d. KEY TO SAME, net 1s.

"We cordially recommend it to the notice of all teachers."—*Educational News.*

Relfe Brothers' Charterhouse Atlas. Containing Thirty-eight Maps—including Railway Map of the British Isles; Map of the Environs of London, Liverpool, Manchester, etc.; large Scale Map of Palestine, and a good clear Map of the World, as known to the Ancients; large and clear Map of South Africa, etc. Folio size, cloth, 1s.

Pierre et Camille. By ALFRED DE MUSSET. With Notes and Vocabulary and Table of Irregular Verbs. By the Rev. J. HEWETSON, M.A. Cloth, price 9d.

Public Examination Scripture Manuals. By A. RICHES, F.R.A.S., F.R.G.S.

The Gospel of St. Luke. 1s. 6d.
St. Mark. 1s.
St. Matthew. 1s. 6d.
The Acts of the Apostles. 1s. 6d.
Each containing a Map.
The Church Catechism. 9d.

"Will be found of great service to any teacher....concise and satisfactory."—*British Mail.*

"Will prove exceedingly serviceable."—*The Bookseller.*

"A valuable aid to teachers."—*Christian World.*

St. Matthew's Gospel. With Introduction, Notes, and Comments on the Authorised and Revised Versions. By G. CARTER, M.A. Crown 8vo. Third Edition. Cloth, 1s. 6d.

English History, 1689-1897. By G. CARTER, M.A., Author of "Outlines of History," etc. 296 pages. Crown 8vo, cloth, 2s.

This Volume covers the period set for Cambridge Locals, 1901.

"Will prove a thoroughly reliable and most useful manual for those preparing any part of the period 1689-1897 as a 'Special Period' of English History. Tables and Summaries much enhance the value of the book."—*Educational News.*

"We recommend it as a sound, scholarly, and interesting handbook."—*Educational Times.*

Volume containing the period 1485-1689 is in preparation, and will be published shortly.

Summary of English History. For the Use of Middle-Class Schools, etc. (Contains a List of Questions set at various Public Examinations.) By ARTHUR WOOD. Crown 8vo, 1s.

Complete Catalogue of R.B.'s School Text Books, Prize Books, Copy Books, etc., free upon application.

RELFE BROTHERS, Limited, **Educational Publishers, Booksellers, and School and College Stationers,**

6 CHARTERHOUSE BUILDINGS, ALDERSGATE, LONDON, E.C.

Elementary Lessons

. . IN . .

Free-arm Drawing

By FLORENCE HEWITT.

Pp. vi + 87, with 323 + 7 Illustrations, price 3/6 net; post free, 3/9.

THIS is a most **Comprehensive Treatise** on this important development of Drawing, and is fully Illustrated by means of **330 Photographs, Diagrams, and Examples.**

It begins with the very **Simplest Exercises,** and provides several complete **Courses of Lessons,** with **Hints** for carrying on the work; points out the difficulties the teacher will meet with, and how to overcome them; and carries on the Teaching from the simplest elements which may be taught in the Infant School to the more advanced work suitable for Standards I., II., III., and IV.

Teachers will find the Illustrated Chapter on **Necessary Apparatus,** its **Cost,** and how to **Use** it, most helpful.

E. J. ARNOLD & SON, Ltd., LEEDS.

READING PRESCRIBED FOR CANDIDATES, 1902.

SIR WALTER SCOTT'S

OLD MORTALITY.

EDITED BY

ARTHUR T. FLUX,

PRINCIPAL BELVEDERE PUPIL TEACHERS' CENTRE.

Crown 8vo, 500 pages, price 1/6 in cloth.

CONTAINING INTRODUCTION, HISTORICAL SKETCH OF THE SCOTTISH CHURCH, TABLE OF RELIGIOUS SECTS, MAP OF THE SCENE OF THE TALE, COMPLETE TEXT, 62 PAGES OF EXPLANATORY NOTES, AND INDEX.

"The editor knows his Scott well, and understands both what should be included and what should be omitted from a school text."—*The Guardian.*

TO BE HAD OF ALL BOOKSELLERS.

PUBLISHED BY A. & C. BLACK,
SOHO SQUARE, LONDON, W.

THE EDITOR'S TABLE

A SEASONABLE SERIES FOR BUSY READERS.

NELSON'S NEW CENTURY LIBRARY OF DICKENS, THACKERAY, AND SCOTT.

Good literature has much to contend with—more perhaps nowadays, when there are so many magazines of short stories and other aids to easy reading, than half a century ago, when, although all literature was not irreproachable, there was not so much in the gross to divide the attention of the reader. Yet, despite this appalling surfeit of printed matter, the classics of prose fiction still hold their own; and the constantly appearing new editions of Scott and Thackeray and Dickens are numerous enough, and—in the matter of "thousands"—large enough to set the most successful modern novelist wondering how his own work will be treated by posterity. And amongst all these new editions, the most practical and practicable, from the reader's point of view, is "The New Century Library," now being issued by Messrs. Nelson and Sons. For in the stress and hurry of business life the new century man has to get his reading done in all sorts of places. The bulky standard edition and the unhandy three volumes do not at all serve his turn. Nor, if spectacles are to be avoided, and in course of time to be relegated to the museum-case as curiosities, must he pore over the small print which has too often characterised our pocket libraries. We can remember how difficult, even to good eyes, was the reading of Charles Dickens in certain volumes which burdened the family shelves; and though the type of Thackeray was a trifle less trying, his mere bulk was against him. However, Messrs. Nelson have changed all that; for by the use of India paper, hitherto familiar only to Bible readers, they have been able to increase the type and to reduce the bulk of both. Still, "for a' that an' a' that," like true Scotsmen they have reserved their best efforts for the Wizard of the North, and the new issue of Scott is a truly artistic production, bound in what we believe it is correct to call an "art green," stamped with the national thistle and the rampant lion. It should prove especially attractive to all those Southrons who go beyond Tweed for their well-earned rest.

We can heartily recommend these volumes to prize-givers and prize-winners, to busy men and lazy men, to travellers and holiday makers, and—since in the new century we are all going to live in flats, where every inch of space will be of moment—to everybody.

ALLMAN AND SON, LTD.

Practical Bookkeeping. Part II. Advanced. By W. D. Oldham, Chartered Accountant, and W. E. Holland, Incorporated Accountant. We had pleasure in reviewing and recommending the first part of this work, and the second or advanced part is equally worthy of commendation for its usefulness.

The first part embraced only the accounts of tradesmen and merchants, but in this volume the accounts of manufacturers, contractors, hotel-keepers, etc., calling for the introduction of specially-ruled books, are carefully considered and explained. After a diligent study of the various examples, the student should be able to devise a good system for recording the transactions of any business with which he may be connected.

The exercises and questions on the chapters will be appreciated by students; and there are exercises based on papers set at the Civil Service, Society of Arts, and other examinations. There is an alphabetically arranged glossary of commercial terms, phrases, and abbreviations.

The work concludes with a series of recent examination papers set at various institutes, and covering the whole system of bookkeeping.

One of the authors is the instructor of bookkeeping at a technical institute, and the work is arranged in a practical and clear manner.

Any one who studies the book carefully and works the exercises may rest assured that he will be able to manage any examination paper, and he will be enabled to make practical use of his knowledge in actual business.

E. J. ARNOLD AND SON, LTD.

Theory Notes on Algebra and Mensuration. For Pupil Teachers, Candidates for Scholarship, Certificate, Oxford and Cambridge Locals, College of Preceptors, University, and other Examinations. By G. T. Vine, F.E.I.S., A.C.P. This work deals exhaustively with the theory of algebra and the mensuration of rectangular areas and solids, as far as is required for the various examinations. The definitions are good, and the proofs are clearly explained.

The consideration of the rules for multiplying po-itive and negative quantities and two negative quantities is well done, and the chapter on factors is useful and interesting.

The chapters on the theory of indices and surds are well and carefully arranged, and there is a summary of the chief index laws and their corollaries.

The rules and proofs of rectangular areas and solids are illustrated by diagrams.

Questions from different examinations are given at the end of each chapter, and each question has a paragraph reference to the part of the book where the subject is treated, or where a hint to the solution may be found. Answers are given to the questions, with the exception of theory questions and definitions.

This book will be hailed with pleasure by students, as it supplies a long-felt want, the proofs being more explanatory than those usually found in text-books.

GEORGE BELL AND SONS.

The Alcestis of Euripides. By E. H. Blakeney, M.A. This is a very useful volume of Bell's Illustrated Classics. The text is founded on that of Franck, and variations from his text are noted in an appendix. A general introduction by E. C. Marchant, M.A., contains sections on chorus and dialogue, Greek drama and religion, time of performances, place of performances, manner of performances, Euripides. A short introduction by the editor treats of the play and its structure, its plot, and the problem of the Alcestis. The notes are clear, thorough, and rather copious. It seems hardly worth while to have placed a few notes contributed by Mr. Thelwall apart from the others. There is an appendix on the conditional sentence, and a good short note (Appendix E) on books bearing more or less directly on the play. The full grammatical index will be found useful by students, and there is a complete Greek-English vocabulary. The illustrations are very well chosen. "Hercules wrestling with Death for the Body of Alcestis," from Leighton's painting, is rather too darkly printed. The Theatre of Dionysus at Athens is taken from a photograph, and the bust of Euripides from a cast in the University Galleries, Oxford. The smaller illustrations are taken from wall paintings, statues, statuettes, vases, and bas-reliefs.

Scalae Tertiae. By E. C. Marchant, M.A. This Third Latin Reader has for introduction a note on the metre of Phaedrus. Fourteen of his fables are given. Fifteen passages from Ovid and fifteen from Cicero are arranged, as far as possible, in the order of their difficulty. One-fourth of the book consists of extracts from Cornelius Nepos, placed in chronological order according to the subject with which they severally deal. The editor has taken pains, in making the selections, to ensure that the words used shall occur several times in the book. The text here and there has been slightly altered. Among the illustrations are Athens from the south-east, a map of the ports of Athens, and a plan of Syracuse. The notes are short, and suitable for beginners. They consist mostly of hints for translation, with grammatical hints. There is no grammatical index, but there is a Latin-English vocabulary. The book is clearly printed and strongly bound.

OXFORD UNIVERSITY PRESS.

A School History of England. With Maps, Plans, and Bibliographies. Crown 8vo, cloth. 3s. 6d. [*Immediately.*

The Relations of Geography and History. By the Rev. H. B. GEORGE, M.A., Fellow of New College, Oxford. Crown 8vo, cloth. 4s. 6d.

Thucydides.—Histories, Book III. Edited, with Notes, for the use of Schools, by HERBERT F. FOX, M.A. Crown 8vo, cloth. 3s. 6d.

Euripides.—Hecuba. Edited by C. B. HEBERDEN, M.A., Principal of Brasenose College, Oxford. Extra fcap. 8vo, cloth. 2s. 6d.

Demosthenes.—Speech against Meidias. With Introduction and Notes by JOHN R. KING, M.A., Fellow of Oriel College, Oxford. Crown 8vo, cloth. 3s. 6d.

A Concise French Grammar, including Phonology, Accidence, and Syntax, with Historical Notes for use in Upper and Middle Forms. By ARTHUR H. WALL, M.A., Assistant Master in Marlborough College. Crown 8vo, cloth. 4s. 6d.

Historical Primer of French Phonetics and Inflection. By MARGARET S. BRITTAIN, M.A. With Introductory Note by PAGET TOYNBEE, M.A. Extra fcap. 8vo, cloth. 2s. 6d.

The "Junior" Euclid.—Books III. and IV. By S. W. FINN, M.A. Crown 8vo. [*Shortly.*

The Student's Handbook to the University and Colleges of Oxford. Fifteenth Edition. Revised to January 1901. Cr. 8vo, stiff boards. 2s. 6d. net.

London: HENRY FROWDE, Oxford University Press Warehouse, Amen Corner, E.C.

RULES OF

FRENCH GRAMMAR AT A GLANCE.

For Teachers and Students.

By O. F. CAMPHUIS.

Being a Summary of the Difficulties of the Language, in a Practical and Simplified Form, as a Text-Book for use in the Class, and in preparation for Examinations. *Demy 8vo, wrapper, 1s.; cloth, 1s. 6d.*

"Candidates for examination will find this summary of rules and exceptions very useful."—*Cusack's Journal.*

FIRST FRENCH COURSE. (AHN, DR. F.)

Being a Class-Book for Beginners. Adapted from the German Original by A. DUDEVANT. Edited and Revised by C. A. THIMM, F.R.G.S.

MARLBOROUGH'S EDITION. *8vo, cloth, 1s. 6d.*

New Catalogue of Foreign Languages gratis on applicant mentioning this publication.

London: E. MARLBOROUGH & CO., Publishers, 51 Old Bailey, E.C.

THE FITZROY PICTURES.

For Schools, Churches, Mission Rooms, and Hospitals.

Designed by HEYWOOD SUMNER, SELWYN IMAGE, C. W. WHALL, LOUIS DAVIS, and C. M. GERE.

Prices from 6d. to 5s. 6d.

Full Illustrated Prospectus on application to the Publishers—

GEORGE BELL & SONS,

YORK STREET, COVENT GARDEN, LONDON.

THOMAS MURBY'S

NEW WORKS & NEW EDITIONS.

ANALYSIS OF ENGLISH HISTORY. King Edward VII. (97th Edition.) By W. C. PEARCE and Dr. HAGUE. Completion of the Reign of Queen Victoria and commencement of that of King Edward VII. By W. F. BAUGHST, Westminster City Schools. With Eight Full-page Maps. Price 1s.; or with Biographical Appendix, 1s. 6d.

MELDOLA'S INORGANIC CHEMISTRY. Metals and Non-Metals. With Chapters on Chemical and Spectrum Analysis, Chemical Laws,- Deduction of Formulæ, and Modes of Chemical Action. By RAPHAEL MELDOLA, F.C.S. Revised by J. CASTELL-EVANS, F.I.C. (5th Edition.) Cloth, 2s.

CASTELL-EVANS' EXPERIMENTAL CHEMISTRY. Including Qualitative and Quantitative Analysis. By JOHN CASTELL-EVANS, F.I.C., Technical College, Finsbury. (4th Edition.) Price 2s. 6d. With Key, 6s.; Key alone, 3s.

"Far in advance, from an educational point of view, of anything that has appeared as yet in this country."—*Journal of Education.*

SKERTCHLEY'S GEOLOGY. (10th Edition.) Revised by JAMES MONCKMAN, D.Sc. Price 1s. 6d., cloth.

SKERTCHLEY'S PHYSICAL GEOGRAPHY. (32nd Edition.) Revised by J. H. HOWELL, B.A., Civil Service Department of King's College. 1s., cloth.

RUTLEY'S MINERALOGY. (12th Edition.) Containing a New Section on the recently adopted treatment of Crystal Symmetry, with Table of the 32 Symmetry Groups. 2s., cloth.

HOBBS' ARITHMETIC OF ELECTRICAL MEASUREMENTS. (8th Edition.) With numerous Examples fully worked. 1s., cloth.

DR. W. KRISCH'S FRENCH PRONUNCIATION. In English Phonetics. With the New Decree on French Syntax. Price 1s., cloth.

"Of its kind this is the best text-book we have seen. The system is really good, and as sound as such a system can be made."—*Educational News.*

London: THOMAS MURBY, 3 Ludgate Circus Buildings, E.C.

CODE BOOK-KEEPING, Etc.

SARLL'S BOOK-KEEPING FOR NEW CODE. Stage I. Introductory; II. Practical; III. Theory or Journalising. Each 48 pp. Price 4d. Outline Keys. MS. Books, 2d. each. *Schoolmaster says*:—"They are the *best and cheapest* manuals of the kind in the market."

SARLL'S PRACTICAL BOOK-KEEPING. Fourteenth and *greatly* improved Edition. *Teachers' Aid* says:—"There is no *cheaper* and *safer* guide." Consists of Grad. Exercises and Exam. Papers, with *full* or *outline* Keys. 128 pp. 1s. MS. Books, superior, 1s. Cheap, 4d.

SARLL'S DOUBLE-ENTRY BOOK-KEEPING. Fifteenth Edition. 2s. Complete with *full* or *outline* Keys. *Practical Teacher* says:—"We *heartily* recommend it as the *best* and *cheapest* manual we have seen." For Soc. of Arts Exams., Civil Service, &c. 256 pp. MS. Books, 1s. Cheap, 4d.

SARLL'S TWENTIETH CENTURY EXAM. PAPERS IN BOOK-KEEPING. Containing the *latest* papers by the *leading* EXAMINING BOARDS, with notes and brief answers, in two parts, SIXPENCE each. Part I. JUNIOR PAPERS, College of Preceptors, &c., ready *shortly*; Part II. SENIOR PAPERS, Society of Arts, &c., ready in *September* 1901.

SARLL AND SOC. OF ARTS—NEARLY 1,600 CERTIFICATES and Two BRONZE MEDALS. Results unsurpassed by any teacher in Great Britain.

SUPPLEMENTARY KEYS. Now Ready.

I. TO SARLL'S PRACTICAL. Containing FULLY-WORKED Keys to *all* the Exam. Papers in Practical at 1s., and to *all* the Exercises in Stages I. and II. at 4d. TWO SHILLINGS.

II. TO SARLL'S DOUBLE-ENTRY. Containing FULLY-WORKED Keys to *all* the Exam. Papers in "D Entry" at 2s., and to *all* the Exercises in Stage III. at 4d. THREE SHILLINGS.

*** Specimen Copies—except Keys—at one-third off, or Teachers can have Parcels for Inspection, Post Free, from A. SARLL, A.K.C. (Lecturer, People's Palace, E., Polytechnic, W., &c.), 62 Oakley Road, London, N.

Twenty Lessons by Correspondence for 10s. 6d.

London: GEORGE GILL & SONS, 13 Warwick Lane, E.C.

UNIVERSITY OF CAEN (FRANCE).

FRENCH HOLIDAY COURSES

By the SEASIDE in NORMANDY.

Under the Patronage of the

"ALLIANCE FRANÇAISE."

Three Weeks or a Fortnight in August 1901.

Syllabus, post free, on application to Prof. L. BASCAN, Caen.

ADAM AND CHARLES BLACK.

A School Geography of the World. By L. W. Lyde. This is a valuable book. It is the work of an earnest student of the subject, written for earnest students, and consists not of a collection of dry geographical details, but of a masterly exposition of the principles underlying physical and political geography. The student is led to see the why and the wherefore at every step, and it will probably dawn on him, before he has read far, that the subject of geography is much more educative than most people give it credit for.

Wisely, the writer has focused his efforts on the most important or the most interesting parts of the world, such as the British Isles, the British Empire, the United States, Africa, etc.; but every region has received attention, and has been dealt with on the same plan. In that plan he has first shown the influence of the sea, where the country has a coast at all. Then he has examined the surface, dealing with mountains, then rivers. Next follow the climate, vegetation, fauna, minerals, etc. This seems to us a logical order.

The most important statements are printed in prominent type, and ranged under these are subsidiary paragraphs directly connected with them. This method the student will find very helpful for their assimilation, and also for their reproduction in the examination room. There is not a dull page from cover to cover. The book contains no maps; and the questions, which are excellent, might well have extended to three or four pages. There is an index.

BLACKIE AND SON.

The Raleigh Geographies. VII.: A Brief Introduction to Commercial Geography. This book is intended as an introduction to commercial geography. We have perused its pages with pleasure, and though we have examined several books written for a like purpose, we have not seen a better. Much sound judgment has been exercised in planning the book, in not trying to do what was impossible. The matter has been limited to the commercial concerns of the Anglo-Saxon race, and it is wonderful what the writer has gathered together about the trade of the British Empire and the United States. The facts display very extensive knowledge of his subject, and also wide research. Besides being full, the matter is accurate, and quite up to date. The book is well written on the whole, though we found the first few chapters somewhat laboured. On p. 47, in the last paragraph, we have, "The British Empire possess more than half;" and in the next sentence, "fifty-five out of every one hundred" is pedantic. On p. 52, bottom paragraph, we have, "The population of this vast city, with its vast trade, is vast almost beyond belief;" the word vast might be relieved from doing treble duty. Again, on p. 53, top line, "for which constant coming and going of what is a vast navy every week 700 acres of docks are provided" needs recasting. Also on p. 54, second paragraph, we have, "In the grandly-rolling navigable rivers, and equally grand lakes, which are together almost as big as our whole country," the writer leaves us in doubt whether the lakes are together greater than our whole country, or the rivers and lakes together. On p. 78, cinchona is spelt "chinchona."

The chapter on the "seasons" is out of place in a work of this character. A youth capable of grasping "the present conditions and future possibilities of the commerce of our great empire," mentioned in the preface, ought to be stages beyond "you could yourself keep turning round, while you went right round your schoolfellow," mentioned on p. 29. We are glad to see the thrust at our stupid patent laws on p. 165. There is a vein of patriotism running through the book which we are pleased to note. It is necessary for the rising generation to realise that it has a noble heritage. The summaries afford an excellent opportunity for revision and mastery of facts, and occupy about twenty pages. The maps are useful and sufficient.

The Douglas Readers. Book III. This reader is one of a series which contains both history and geography, and has been specially designed to provide Scottish children with the information as to the special part that Scotland has played in British history, and the special lines on which Scottish progress and development have proceeded. In weaving in, with the history, as much geography as will help the child to localise the places referred to, the book is working on modern and scientific lines. The history is well written in vigorous English, and the pages are brightened by seven or eight poems appropriately placed amidst the historical matter. The illustrations are numerous and good, many being copies of well-known pictures. Paper, printing, and binding will be found satisfactory by both teachers and managers.

CAMBRIDGE UNIVERSITY PRESS.

Education in the Nineteenth Century. Lectures delivered in the Education Section of the Cambridge University Extension Summer Meeting in August 1900. Edited by R. D. Roberts, M.A., D.Sc. (London), Secretary for Lectures of the Local Examinations and Lectures Syndicate. These lectures are, as a whole, deserving of being thus rendered widely and permanently accessible to all the workers in the educational field. Each of the thirteen chapters or lectures may be regarded as the work of a specialist, and, as such, every chapter is of undoubted value. The comparative value which the reader attaches to each will, of course, depend largely on his personal interests; and, in this aspect, it would be useless for the reviewer to select one or several for special praise or blame. In some cases, however, the lecturers have confined themselves unduly to a recitation of mere historical facts, and have somewhat neglected the opportunity of giving the interpretation of these facts which their position would have rendered of such high value. The chief end of such a course of lectures is the interpretation of well-known facts and events which only the specially trained or specially gifted lecturer is able to give. This end is, on the whole, well served by the volume before us. The reader gathers from its pages something higher than an educational history of the century. He learns somewhat of the spiritual forces which have made that history what it is. And in pondering the arguments and opinions advanced, he has the added satisfaction of knowing that in those pages he has a revelation of the mind and thought of men and women who have been active forces in moulding the educational progress of at least the closing decade of that century.

W. AND R. CHAMBERS.

Commercial Correspondence and Office Routine. Second Year's Course. By G. R. Walker. This book has been written for the needs of students working under the syllabus of the Evening Continuation School Code, and meets the requirements of the second year's course. The work covers the preparation of invoices, account sales, price lists, railway rates, telegraphic communication with foreign countries, principal office and warehouse books, banking, inland and foreign bills of exchange, buying and selling goods, exportation and importation of merchandise, insurance, advertisements, etc. Each chapter is clearly written, and carefully covers the ground. As an example of the thoroughness of the work, we may take the chapter on cheques. Here we have first the form of the cheque; then follow cheques payable to order, cheques payable to bearer, the changing of "payable to bearer" cheques into "payable to order," post-dated cheques, methods of crossing cheques, cautions as to presenting cheques for payment, stopping payment of cheques, dishonouring cheques, and cautions as to the method of writing cheques to prevent fraud.

Each chapter is followed by a set of searching questions, while the appendices furnish additional examples that have been actually set in recent commercial examinations. We can speak of the book with unqualified praise.

A. M. HOLDEN.

A Key to a New Arithmetic. This is a key to Messrs. Christian and Collar's *New Arithmetic*, a work which has from time to time been strongly recommended in the Tutorial Section of our journal. To private students preparing for any examination up to London Matriculation, this key will be of great service. It will also save the time of the teacher, in that he should be relieved of much routine work by its possession. Model solutions are given in the *New Arithmetic* to the leading types of examples, but these fail to cover the great variety of examples that present themselves in the study of arithmetic. We trust this helpful key will have the wide sale it deserves among students and teachers.

LONGMANS, GREEN, AND CO.

Object Lessons in Elementary Science. Standards I., II., and III. By A. H. Garlick, B.A., and T. F. G. Dexter, B.A., B.Sc. We have seen no better object-lesson books than these. Being the work of two eminent teachers, they contain not only a valuable amount of matter, but also innumerable suggestions and hints as to the correct method of teaching. To young students desirous of solving the mystery "how to write good notes of lessons," the books are especially helpful; and older teachers who have not time to read up and arrange facts may trust implicitly to what has been done for them here.

Drawing Pencils.

L. & C. HARDTMUTH'S Drawing Pencils are made of the Finest Graphite the World produces. Superior to any other make in regularity and reliability of gradation. Fifty prize medals. The most economical and satisfactory for school and college use. Used in all the great Art Schools throughout Europe.

Grand Prix, Paris, 1900.

SUMMER COURSE IN DRAWING & MANUAL TRAINING AT AMBLESIDE.

Director—Mr. J. VAUGHAN.

This Course will again be held at Ambleside, from July 29 to August 23.

Classes will be formed in **Kindergarten, Paper Work, Colour Work, Cardboard Work, Brush Drawing, Clay Modelling, Blackboard Drawing, Woodwork** ("City and Guilds," and Sloyd), **Metal Work** ("City and Guilds," and Repoussé) **Wood-carving,** and **Cut and Embossed Leather Work.**

The attention of Inspectors and Teachers is called to the opportunity afforded by these classes of seeing the whole range of Manual Training, from Kindergarten upwards, in active operation.

Prospectus, Syllabus, and full particulars on application to the Secretary—

H. WAY, 111 Ramsden Rd., BALHAM, S.W.

Nature Forms.

A Book of . . . . .

Free Drawing.

By HENRY T. WYSE,
Art Master.

Containing Twenty Plates of suitable and suggestive Designs, for use in either the NATURE-KNOWLEDGE or the DRAWING LESSON.

Price post free, net, 3s. 4d.

CHARLES & DIBLE,

LONDON— 10 Paternoster Sq., E.C.
GLASGOW— 155 St. Vincent Street.
DUBLIN—71 Middle Abbey Street.

APPROVED SCHOOL BOOKS.

By Dr. CORNWELL, F.R.G.S.

"We are qualified, by ample trial of the books in our own classes, to speak to their great efficiency and value. We have never known so much interest evinced, or so much progress made, as since we have employed these as our school books."—EDUCATIONAL TIMES.

A SCHOOL GEOGRAPHY. 88th Edition. **3s. 6d.**; or with 30 Maps, **5s. 6d.**
"Very superior to the common run of such books. It contains a good deal of useful matter of a more practical kind than usual, which the exercises are likely to impress on the mind more deeply than by the parrot system."—*Athenæum.*

A SCHOOL ATLAS. Consisting of Thirty Small Maps. A Companion Atlas to the Author's "School Geography." **2s. 6d.**; or **4s.** coloured.

GEOGRAPHY FOR BEGINNERS. 68th Edition. **1s.**; or with 48 pages of Questions, **1s. 4d.** Questions, **6d.**
"A very useful series of educational works, of which Dr. Cornwell is either author or editor. It ('The Geography for Beginners') is an admirable introduction. There is a vast difficulty in writing a good elementary book, and Dr. Cornwell has shown himself possessed of that rare combination of faculties which is required for the task."—*John Bull.*

SPELLING FOR BEGINNERS. A Method of Teaching Reading and Spelling at the same time. 4th Edition. **1s.**

THE SCIENCE OF ARITHMETIC. A Systematic Course of Numerical Reasoning and Computations; with very numerous Exercises. By JAMES CORNWELL, Ph.D., and Sir JOSHUA G. FITCH, LL.D. 26th Edition. **4s. 6d.**
"The best work on arithmetic which has yet appeared. It is both scientific and practical in the best and fullest sense."—*London Quarterly.*

KEY TO SCIENCE OF ARITHMETIC. With the Method of Solution to every Question. **4s. 6d.**

ALLEN & CORNWELL'S SCHOOL GRAMMAR. 65th Edition. **2s.** red leather; or **1s. 9d.** cloth.
"The excellence of the grammar published by the late Dr. Allen and Dr. Cornwell makes us almost despair of witnessing any decided improvement in this department."—*Athenæum.*

GRAMMAR FOR BEGINNERS. An Introduction to Allen and Cornwell's "School Grammar." 88th Edition. **1s.** cloth; **9d.** sewed.
"This simple Introduction is as good a book as can be used."—*Spectator.*
☞ *The Book is enlarged by a Section on Word-building, with Exercises for Young Children.*

THE YOUNG COMPOSER. Progressive Exercises in English Composition. 48th Edition. **1s. 6d.** Key, **3s.**
"The plan of the work is very superior. We are persuaded this little book will be found valuable to the intelligent instructor."—*Westminster Review.*

POETRY FOR BEGINNERS. A Selection of Short and Easy Poems for Reading and Recitation. 13th Edition. **1s.**

SCHOOL ARITHMETIC. 18th Edition. **1s. 6d.** Key, **4s. 6d.**
"Eminently practical, well stored with examples of wider range and more varied character than are usually given in such books, and, its method of treatment being thoroughly *inductive*, it is pre-eminently the book for general use."—*English Journal of Education.*

ARITHMETIC FOR BEGINNERS. Combines simplicity and fullness in teaching the First Four Rules and Elementary Fractions. 9th Edition. **1s.**

London: SIMPKIN, MARSHALL, HAMILTON, KENT, & CO., LIMITED. Edinburgh: OLIVER & BOYD.

WILMOT'S POSTAL COLLEGE.

High-Class Tuition by Correspondence,

for Certificate, Scholarship, College of Preceptors, Oxford and Cambridge Locals, Civil Service, Pupil Teachers', and any similar exam.

Extraordinary Testimonials. Unique Arrangements for payment of Fees.

Address: PROPRIETOR WILMOT'S POSTAL COLLEGE, 33 The Grove, Camberwell, LONDON, S.E.

CORRESPONDENCE COURSES FOR ALL DRAWING EXAMINATIONS.

ARMSTRONG'S DRAWING SCHOOL,

23 The Avenue, Bedford Park, London, W.

Thorough guidance, and criticism of all drawings, by **Mr. C. ARMSTRONG.**

☞ ***For Complete Illustrated Contents of***

THE PRACTICAL TEACHER'S ART MONTHLY

for MAY see page 3 of Cover.

T. MURBY.

Skertchley's Elements of Geology. By James Monckman, D.Sc. Lond., Downing College, Cambridge. This is the *tenth edition* of a work originally written by S. B. J. Skertchley, F.G.S., of the Geological Survey, to which is added a section on *petrology*, a knowledge of which is now required for the South Kensington examinations in geology. It can hardly be called an elementary work on the subject, but rather an epitome of matters the student would have to search for very widely in larger works. To begin with, the nebular hypothesis is discussed, and shown to account for the original formation of the earth and other members of the solar system. Arguments are given against the *theory* of a central fluid, and this is followed by an account of volcanoes and volcanic action, earthquakes being attributable to the same cause—internal heat. In discussing the subject of upheaval and depression, attention is drawn to what is still going on in various parts of the earth. The views of Darwin, Hopkins, Scrope, and Mallet are given on these subjects. Aqueous action, the classification of rocks, and the mode of determining their age, are fully dealt with; and the new Section IV. on petrology has chapters on "Contortion of the Earth's Crust," new matter on volcanic rocks and mineral veins, "Mineral Characters," and "Crystallography." An appendix contains an interesting article on "Geological Surveying," and some South Kensington examination papers in the first and second stages of geology.

THOMAS NELSON AND SONS.

Metric Arithmetics. Books I., II., and III. By G. A. Christian, B.A., and A. H. Baker, B.A. These well-known authors have produced a series of three class books remarkable for simplicity, easy grading, completeness, and scientific accuracy. Such information as is here contained should be taught in all schools. The books specially meet the requirements of the newest Code upper standard work.

A Short History of Ancient Greece. By Henry Johnstone. In this charmingly simple history of the people of ancient Greece the young reader, for whom the book is primarily intended, will find as much to interest him as he would from an ordinary tale of adventure. It is written in as simple language as possible; and where there might be a difficulty with names, these are tabulated at the end of each chapter, divided into syllables, and accented. There are twelve chapters in all, and these are subdivided. This subdivision is not only attractive to a child, but it is exceedingly helpful. Chapter IV., for example, which has the general title "Sparta," is subdivided into "The Dorian Invasion," "Lycurgus and his Work," "The Rulers of Sparta," "Spartan Discipline," "Spartan Conquests," "The Helots," and "General View." The chief points in the history are in this way made prominent. The book is fully illustrated, the illustrations being copies of photographs, and drawings from authentic sources. For the purpose of easy reference, there is an index at the end of the book. The price is 1s. 6d.; and, as the book is well printed and attractively bound, it is very cheap.

GEORGE PHILIP AND SON.

Kent, Past and Present, is an addition to the popular County Readers issued by this firm of publishers for school use. The county of Kent abounds in historic incident, and consequently a description of it must be exceedingly interesting, not only to the children and the "Men of Kent," but to the people of England as a whole. The author, Mr. George F. Bosworth, F.R.G.S., has done the work of compilation in a manner at once comprehensive and complete. Everything of interest—the history, the literature (of and relating to), the centres of industry, the great men, etc., etc.—is related in a pleasant style. Illustrations of many kinds are interspersed throughout the book, and six maps do their share in making this part of the undertaking complete. A useful glossary is appended, and a list of books relating to the history and antiquities of the county is given for the benefit of those who are stirred to read more deeply the rich works that have been written about so interesting a corner of our interesting land. The price of the book is 2s.

SIR ISAAC PITMAN AND SONS.

Business Arithmetic, Elementary Stage. This is a well-compiled Arithmetic suitable for use in commercial classes and schools. Tips for quick work are given throughout the book, mental exercises are set, contracted methods of work are carefully explained, and the examples for practice are such as office boys and clerks are called upon to face in their everyday work. The scope of the book is comprehensive, and ranges from simple addition, through fractions (vulgar and decimal) and the higher rules, to the metric system and the coinage of France. We can cordially recommend its adoption.

RALPH, HOLLAND, AND CO.

The Essentials of French Grammar. By Alfred Barriball, B.A. The author of this book is not unknown to the readers of THE PRACTICAL TEACHER. As lecturer in French and English for many years at the Westminster Training College, his qualifications for the preparation of such a work for young students are of the highest. His experience in teaching French will have long familiarised him with the weaknesses and the difficulties of the learner; hence the numerous cautions and notes to be found throughout this book. Every possible help is given to the student, and there is a large variety of practical examples, and numerous exercises are given for translation from and into French. By a judicious use of different types, underlining, etc., the matter is carefully set out, and tabulated in such a way as to make the teaching intelligible to the dullest of students. Several very useful appendices relating to the plural of nouns, the gender of nouns, etc., a comprehensive chapter on pronunciation, as well as a thoroughly complete and serviceable index of some ten pages, serve to show how much the student has been catered for in what we regard as a good text-book of the French language.

SIMPKIN, MARSHALL, HAMILTON, KENT, AND CO.

Thirty Original Papers in Excise Higher Arithmetic, with Answers and Hints for Solution. By W. Stewart Thomson, M.A., F.S.A., F.R.G.S. This book has been specially designed to furnish an exceptionally full and varied supply of arithmetical papers suitable for most public examinations, and especially for the Civil Service. There are altogether thirty sets of examples, each consisting of twelve problems. Mr. Thomson is an expert who has made the higher arithmetic his thorough study. He has also made a careful study of the vagaries of examiners, and the problems will be found an invaluable preparation for the increased demands which the Civil Service examiners have been making of late years. The book is quite up to date, and candidates may invest with the certain satisfaction that they are getting their money's worth.

SMITH, ELDER, AND CO.

Shakespeare's Life and Work. By Sidney Lee. As we are told in the preface, "This work is a reprint, with some omissions and abbreviations, of the author's *Life of William Shakespeare*." It is an abridgment, intended chiefly for the use of students. The aim of the book has been to give, in a concise and definite form, a summary of the results of research respecting Shakespeare's life and writings. We may at once say that in our opinion the author has most successfully accomplished the task he set himself. The subject is treated in a way only possible to a scholar of Mr. Lee's standing.

The arrangement of the matter is logical and proportionate. We are glad to welcome in this cheaper form such a valuable contribution to literature. The book is well got up, and there are six excellent illustrations.

UNIVERSITY TUTORIAL PRESS.

The Preceptors' Bookkeeping. By Thomas Chalice Jackson, B.A., LL.B. This work is arranged for the requirements of the College of Preceptors, London Chamber of Commerce, National Union of Teachers, and other examinations.

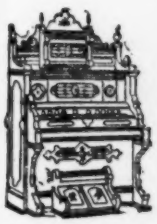
The lessons are arranged in a simple and explanatory manner, and in addition to students of evening continuation and other schools, they may be useful to shopkeepers, who would be able to keep their books efficiently if they studied the work and followed the methods recommended.

Exercises are given on each lesson, and the answers will be beneficial to private students. The lesson on difficulties, and the list of abbreviations in general use, greatly enhance the value of this practical work. The volume concludes with papers from various examinations, and the answers are given to the cash transactions. The work is well suited for the purposes intended, and we can also recommend it for secondary schools.

MESSRS. SAMPSON LOW AND CO. announce the publication, at an early date, of a new series of Bible instruction books, written by the Rev. J. Paterson Smyth, B.D., LL.D., author of *How we got our Bible* (of which book more than 80,000 copies have been sold in this country alone). The series is entitled, "The Bible for the Young: A Series for Schools and Families." The first volumes will be Genesis and St. Matthew, and will be followed by Joshua and Judges, and St. Mark.

BRITISH MUSEUM 1 MY 1901

THE
EDUCATIONAL MUSICAL INSTRUMENT CO.
ESTABLISHED 1881.



For Circular, Testimonials, and ANY Maker's List and designs, apply to the
MANAGER,
43
Estate Buildings,
Huddersfield

21 Argyle Crescent, Portobello, EDINBURGH; or at 20 Highbury Place, LONDON, N. *(Close to Highbury Station and Trams.)*

PIANOS, &c., FOR SCHOOL AND HOME USE.

We are offering a range of instruments **specially made** for School work, at prices within the reach of all. We have supplied some **eleven hundred** for this purpose, and can please you fully, and **save you much money.**

In Pianos and American Organs for Home use our lists indicate the best bargains in the market at the prices quoted, cash or instalments, and **many thousands** of **Teachers, School Managers, etc.,** have testified to the unequalled advantages we offer.

* See our 45 Guinea Piano for £21 Cash, or 36 payments of 14/2 per month.

We pay carriage, give a month's free trial, a ten years' warranty, and **exchange free of cost** if the instrument sent is not all that is desired.

N.B.—All our Pianos are fitted with a special action to the *Soft* Pedal **that fully subdues the tone, and effectually preserves** the instruments during practice.

Mr. JOHN HOPPER, Clerk to the School Board, Hanley, Staffordshire, writes:—"I am instructed to order from you five more Pianos on the terms mentioned in your letter." (We have supplied fourteen Pianos to the Schools under this Board.)

Mr. J. H. YOXALL, M.P., Gen. Sec., N.U.T., writes:—"I enclose cheque in payment for Piano; the choice reflects the greatest credit on your firm. I am entirely satisfied with it in all respects, and I feel sure that a customer benefits very much by taking advantage of your experience and large connection."

Show Rooms open Daily. Call and see our Stock, or write for our List of Instruments for Home or School Use, specifying the class preferred, and you will find

WE CAN SAVE YOU MANY POUNDS.

(Please mention this Paper.)

Keith Prowse & Co
ESTABLISHED 100 YEARS.
NEW CENTURY
NEW MODEL

CASH £26 FREE DELIVERY
OR 30 MONTHLY INSTALMENTS OF 21/-
Come & See It
—or—
WRITE FOR CATALOGUE
MENTIONING THIS PAPER
48 CHEAPSIDE LONDON E.C.

THE MOST NUTRITIOUS.
EPPS'S
GRATEFUL—COMFORTING.
COCOA
BREAKFAST—SUPPER.

. . CRAMER'S . .
Educational Pianos.

THE PORTABLE, Compass 5 Octaves, - 15 Guineas.
In American Walnut and Mahogany.
THE SCHOOL-ROOM PIANO, 7 Octaves, 24 Guineas.
In Ebonised Case.
THE COLLEGE MODEL IRON COTTAGE, 7 Oct., 38 Gns.
In Rosewood, Walnut, and Ebonised.
On Cramer's Three Years' System, or Liberal Discounts for Cash.

J. B. CRAMER & Co., Ltd.,
207 and 209 Regent Street, W., and 46 Moorgate Street, E.C.
Telephone 5012—"Gerrard." *Telegrams—"Fortissimo," London.*

BORD'S PIANOS.

FOR SALE, with 25 per cent. Discount for Cash, or 14s. 6d. per month (second-hand, 10s. 6d. per month) on the Three Years' Hire System. Lists free of CHAS. STILES & Co., 40 and 42 Southampton Row, Holborn, London, W.C.—Pianos exchanged.

BECHSTEIN PIANOS.

These magnificent Pianos for hire on the Three Years' System, at advantageous prices and terms. Lists and particulars free of CHAS. STILES & Co., 40 and 42 Southampton Row, Holborn, London, W.C.

REGISTERED.
Price 2d. A Year, post paid, 4/6.
The IMPERIAL TEACHER
Illustrated.
Edited by
T. B. ELLERY, F.R.G.S.
ASSISTED BY A STAFF OF ACTIVE TEACHERS.
ISSUED TWICE A MONTH.
An Ideal Paper for the Teacher.
BE SURE YOU GET IT!
R. J. BERKINSHAW, *Publisher,*
25 BEDFORD STREET, STRAND, LONDON.

The Royal School Series.

Nelson's SCHOOL AND COLLEGE TEXT-BOOKS.

Just Published.

DIFFERENTIAL AND INTEGRAL CALCULUS FOR BEGINNERS.
Specially arranged to suit the requirements of
STUDENTS OF PHYSICS AND MECHANICS.
By EDWIN EDSER, A.R.C.S., F.Ph.S.,
Lecturer in Mathematics and Physics, Author of "Heat: for Advanced Students." 253 pages. Cloth extra, price 2s. 6d.

*** It is sought in this book to explain the essential principles of the Calculus shorn of all extraneous difficulties, and to lead the student by natural and easy stages to the application of these principles to important problems in mechanics and physics.

ELEMENTARY PRACTICAL CHEMISTRY. For Schools of Science. By THOS. CARTWRIGHT, B.A., B.Sc. Numerous Illustrations. Cloth, 2s.

DOMESTIC SCIENCE. The Science of Domestic Economy and Hygiene treated Experimentally. By THOS. CARTWRIGHT, B.A., B.Sc. With many Illustrations. Cloth, 2s. Or in Three Parts, limp cl., 8d. each.

AN ELEMENTARY COURSE IN PRACTICAL PHYSICS. By F. CASTLE, M.I.M.E. With many Illustrations and Diagrams. 226 pages. Crown 8vo, cloth extra, price 2s.

TIMBER AND TOOLS. A Text-Book for Manual Training Classes, to accompany "Woodwork for Schools." By JEROME WALLACE, F.E.I.S. Numerous Illustrations and Diagrams. Cloth, price 3s. 6d.

BROOK'S DESCRIPTIVE GEOGRAPHY. By SAMUEL BROOK, Head-master, Senior Practising Schools, Westminster Training College. Thoroughly Revised and Improved. New Matter, new Maps, new Type. With Diagram and Illustrations. New Edition. 637 pages. Cloth, price 3s. 6d.
The top Student in the Queen's Scholarship Exams., 1893 and 1899, used Brook's Geography.

"SECTION ONE" PHYSIOGRAPHY. By THOMAS CARTWRIGHT, B.A., B.Sc. Price 2s.

"SECTION TWO" PHYSIOGRAPHY. By THOMAS CARTWRIGHT. Price 2s. Each with numerous Illustrations. These two books cover Pupil Teachers' Course, Scholarship Syllabus, South Kensington Syllabus.

GREGORY'S ELEMENTARY PHYSIOGRAPHY. By Professor RICHARD A. GREGORY, Oxford University Extension Lecturer, Fellow of the Royal Astronomical Society, etc., etc. With an Appendix by THOS. CARTWRIGHT. Price 2s. 6d.

GREGORY'S ADVANCED PHYSIOGRAPHY. By Professor R. A. GREGORY, and J. C. CHRISTIE, Lecturer in Geology at the Glasgow and West of Scotland Technical College. A New and Revised Edition, with Supplementary Matter by THOMAS CARTWRIGHT. Price 4s.

HONOURS PHYSIOGRAPHY. By R. A. GREGORY, F.R.A.S., and H. G. WELLS, B.Sc. (Lond.). Cloth extra, price 6s.

PHYSICAL AND ASTRONOMICAL GEOGRAPHY. By Prof. R. A. GREGORY. Specially designed for Pupil Teachers and Scholarship and Certificate Candidates. With Original Illustrations. Crown 8vo, cloth extra, price 3s. 6d.

GREEK AND ROMAN HEROES. Selections from Plutarch's Lives. Adapted for Class Reading by H. SPENSER, LL.D., Classical Master in the Edinburgh Academy. Price 2s.

FRENCH AND GERMAN.—The New Method.

ELEMENTARY OBJECT LESSONS IN FRENCH. Book I. By ALEC CRAN, M.A. With many Illustrations. Post 8vo, cloth, price 1s. 6d.

ELEMENTARY FRENCH AND GERMAN OBJECT-LESSON WALL SHEETS. A Series of Eleven Sheets, 21 inches by 31 inches, printed in tints on strong Manilla paper, and mounted on roller. Price 15s. per Set.

PHONETIC DRILL SHEETS. For use with Cran's "Elementary Object Lessons in French." A Series of Seven Sheets, 39½ inches by 28 inches, printed on strong Manilla paper, and mounted on roller. Price 15s.

OBJECT LESSONS IN FRENCH. Book II. By ALEC CRAN, M.A. Post 8vo, cloth. With many Illustrations. Price 1s. 6d.

FRENCH AND GERMAN OBJECT-LESSON WALL SHEETS. A Series of Eleven Sheets, 21 inches by 31 inches, printed in tints on strong Manilla paper, and mounted on roller. Price 15s. per Set.

MÉTHODE NATURELLE POUR APPRENDRE LE FRANÇAIS. Fondée sur l'Enseignement Intuitif. By GEORGE HOGBEN, M.A. Illustrated. 332 pages. Post 8vo, cloth, price 3s. 6d.
Also issued in Two Parts. Part I., 2s. Part II., 2s. 6d. Teacher's Book, 6d.

SET OF WALL SHEETS. To accompany "Méthode Naturelle." Fifteen Sheets mounted on one roller, size 30 inches by 21 inches, printed in tints or colours. Price 21s.

TRÉSOR DES FÉVES ET FLEUR DES POIS. (Conte des Fées.) Par CHARLES NODIER. Edited, with Notes and Vocabulary, by EMILE B. LE FRANÇOIS, French Master to the Bristol School Board, Editor of "Achille et Patrocle," etc. Price 1s.

OBJECT LESSONS IN GERMAN. By J. J. TROTTER, M.A., German Master, Royal High School, Edinburgh. Based on "Object Lessons in French." Illustrated. Post 8vo, cloth, price 2s.

NELSON'S FIRST GERMAN READER. Edited by J. J. TROTTER, M.A. Post 8vo, cloth, price 2s.

Adopted by the London School Board.

An entirely New Series of Literary Reading Books.

The Royal Princess Readers.

Specially adapted to Girls' and Mixed Schools, but containing much that will benefit and delight Boys.

NEW LESSONS. CAREFULLY GRADED.
MANY COLOURED ILLUSTRATIONS.

The Lessons are carefully selected, graduated, and edited. The Illustrations are the work of well-known artists. Many Coloured Pictures, beautifully reproduced by the Three-Colour Process, adorn each book. The type is beautifully clear. The paper and binding are of the highest quality.
No pains have been spared to make THE ROYAL PRINCESS READERS the most attractive yet published.

Book I. Price 8d. **Book II. Price 10d.**
Book III. Price 1s. **Book IV. Price 1s. 3d.**
Books V. and VI. *are in Preparation.*

"They will make friends wherever they go."—*Schoolmaster.*
"Sure to be popular with the children. The lessons are most interesting."—*Board Teacher.*

DRAWING, DESIGN, AND MANUAL OCCUPATIONS.

Now Ready, Stages I. and II.

NELSON'S New Drawing Course.

By J. VAUGHAN,
Art Master, School Board for London.

The only scheme published for co-ordinating the ordinary forms of Manual Occupations with Freehand, Freearm, Ruler Drawing, and Design.
Each set consists of ten strong Manilla paper sheets printed on both sides, one side outline, the other in colour.

Set I. and Set II. now Ready.

Size of sheets, 20 by 27 inches, mounted on roller to turn over.
Price 12s. 6d. per Set. Also on stout cards, in strong cloth portfolio, 15s.
Illustrated Prospectus on application.

A FASCINATING SYSTEM OF INSTRUCTION.

NELSON'S Illustrated Composition Series.

A FIRST ILLUSTRATED COMPOSITION BOOK. 64 pp., limp cloth, 4d.
SECOND ILLUSTRATED COMPOSITION BOOK. *[Nearly ready.*
PICTURE ESSAYS. An Illustrated Composition Book for more advanced classes. 112 pages, stiff paper cover, 4d.; limp cloth, 6d.

*** In these books the scholars gather much of the material for the Exercises from the series of descriptive pictures contained in the books themselves. The rules of grammar connected with composition are given in a series of graduated exercises in Books I. and II.

NELSON'S Metric Arithmetics.

SIMPLE. GRADUATED. SCIENTIFIC.

By G. CHRISTIAN, B.A., and A. H. BAKER, B.A.
Three Books providing a Complete Course.

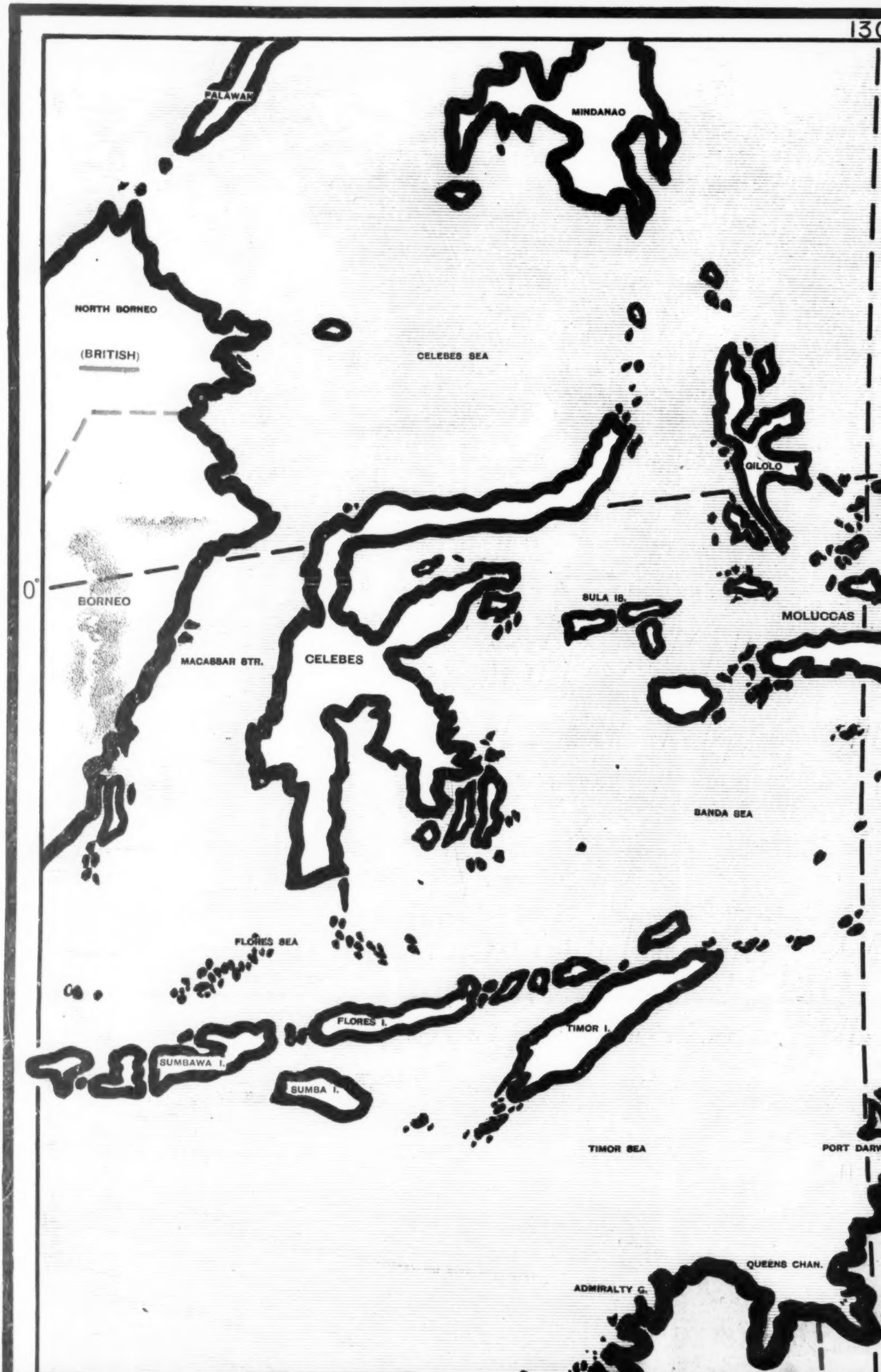
Books I. and II. Paper cover, 2d. each; cloth, 3d. each.
Book III. Paper cover, 3d.; cloth, 4d.
Answers for the Three Books in One. Price 2d.

"Characterised by clearness of exposition and accuracy of working and printing."—*Educational Times.*

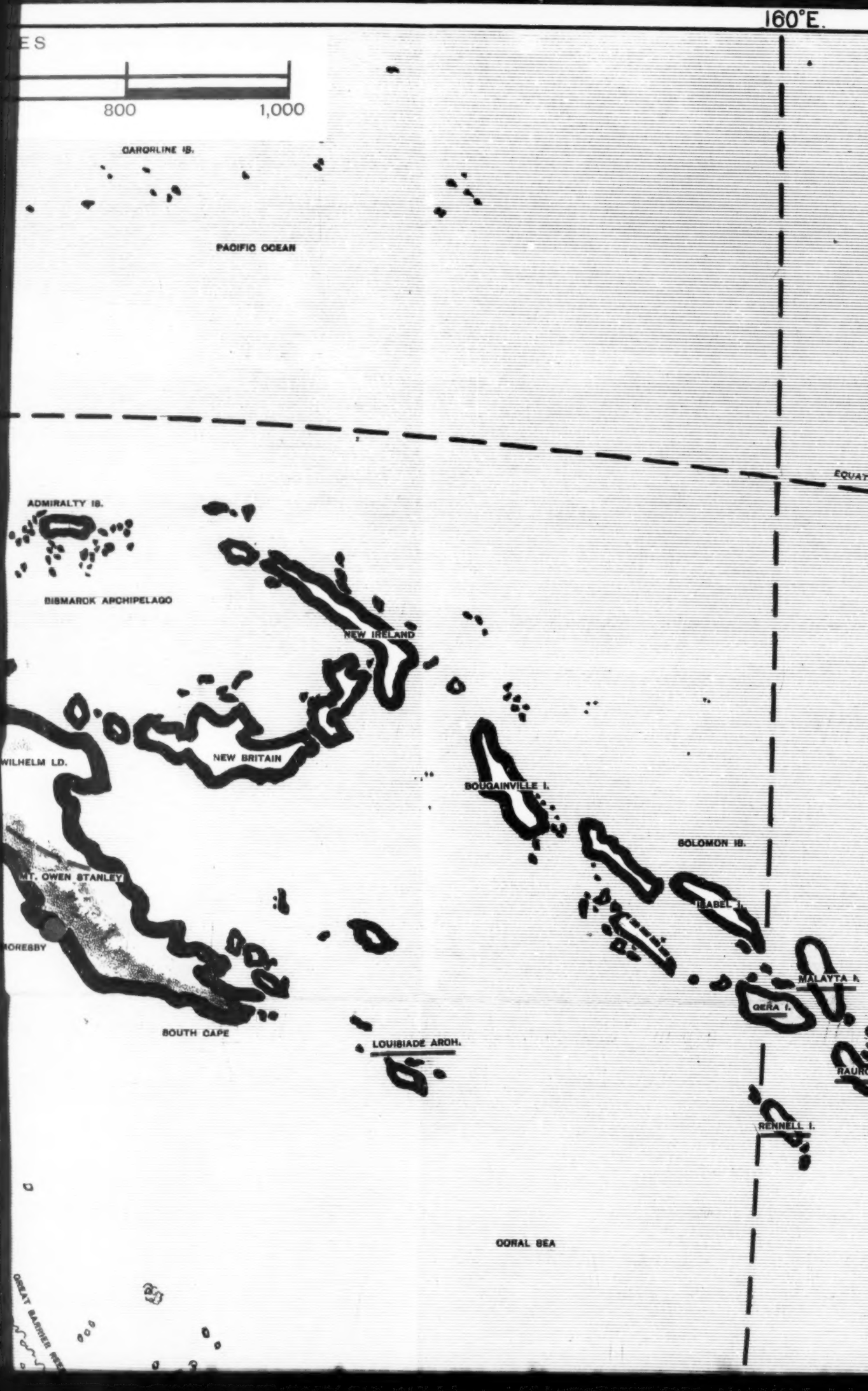
*** *New Complete Catalogue of the Royal School Series post free on application.*

T. NELSON & SONS, 35 & 36 Paternoster Row, London, E.C.; Parkside, Edinburgh; and New York.

Presented with THE PRACTICAL TEACHER, Vol. XXI., No. II.]



130°E.
SCALE OF ENGL
0
200
400
PELEW IS.
GEELVINK B.
M'CLUER INLET
OLUCCAS
(GERMAN)
PAPUA or NEW GUINEA
KEI IS.
ARU IS.
(BRITISH)
FLY R.
TIMOR LAUT IS.
P. FREDERICK HENRY I.
ARAFURA SEA
TORRES STRAIT
C. YORK
MELVILLE I.
C. ARNHEM
PORT DARWIN
ARNHEM LAND
PALMERSTON
GULF OF CARPENTARIA
COOKTOW
CAPE YORK PENINSULA


160°E.
ES
800
1,000
CAROLINE IS.
PACIFIC OCEAN
EQUAT
ADMIRALTY IS.
BISMARCK ARCHIPELAGO
NEW IRELAND
NEW BRITAIN
WILHELM LD.
BOUGAINVILLE I.
SOLOMON IS.
MT. OWEN STANLEY
ISABEL I.
MORESBY
MALAYTA I.
GERA I.
SOUTH CAPE
LOUISIADE ARCH.
RENNELL I.
CORAL SEA
GREAT BARRIER REEF

0°E.

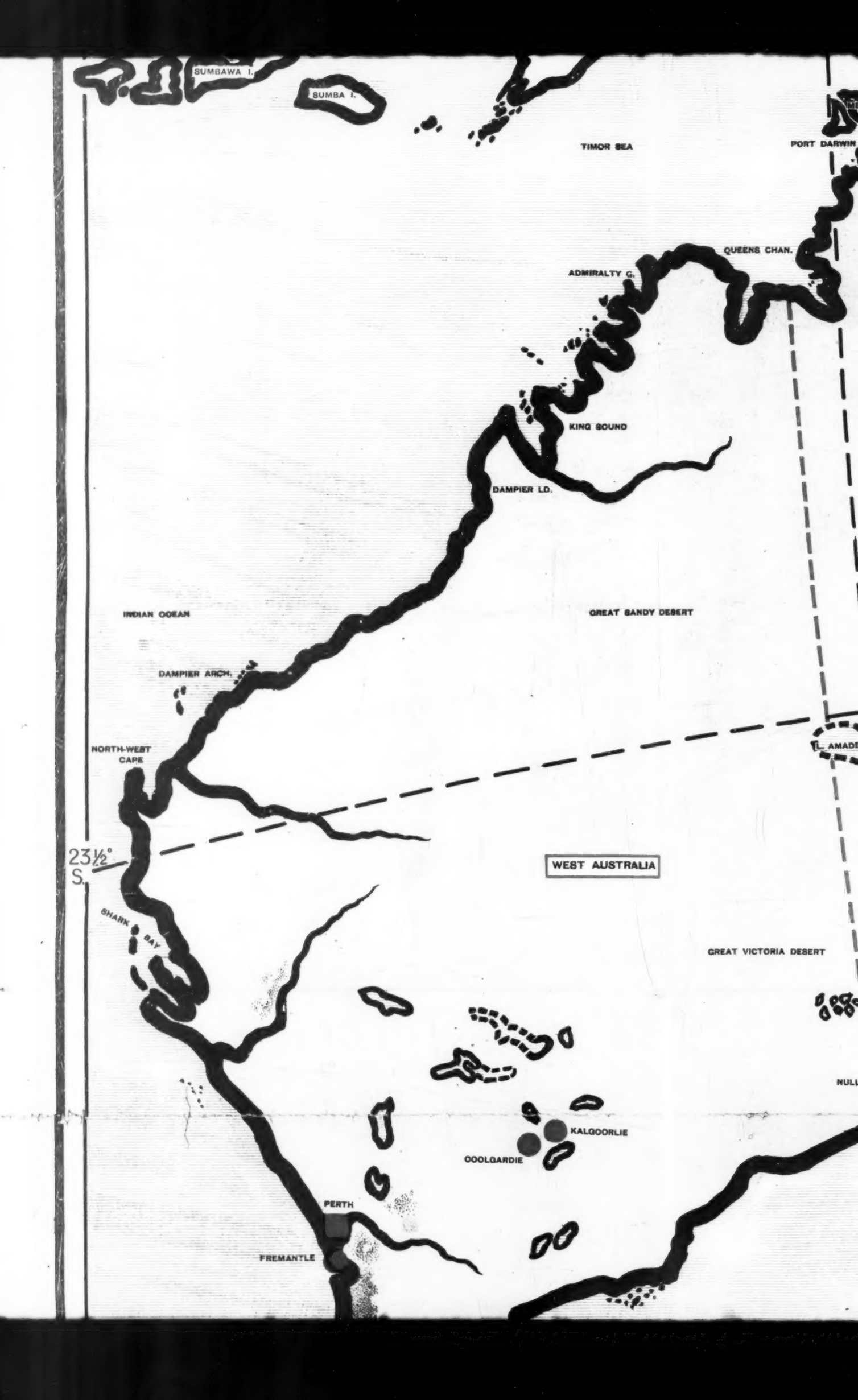
BRITISH ISLES ON SAME SCALE

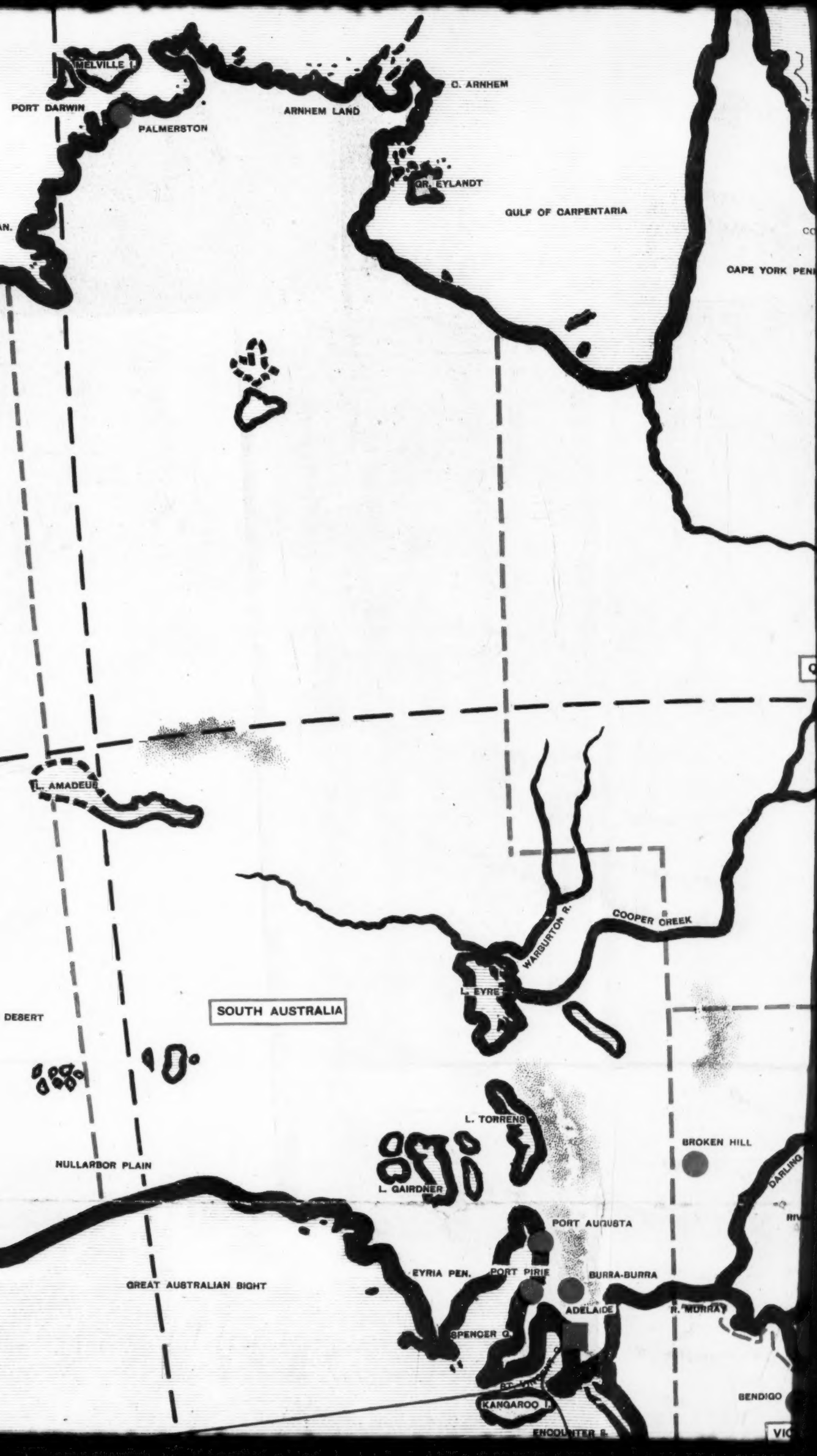
EQUATOR

MALAYTA I.

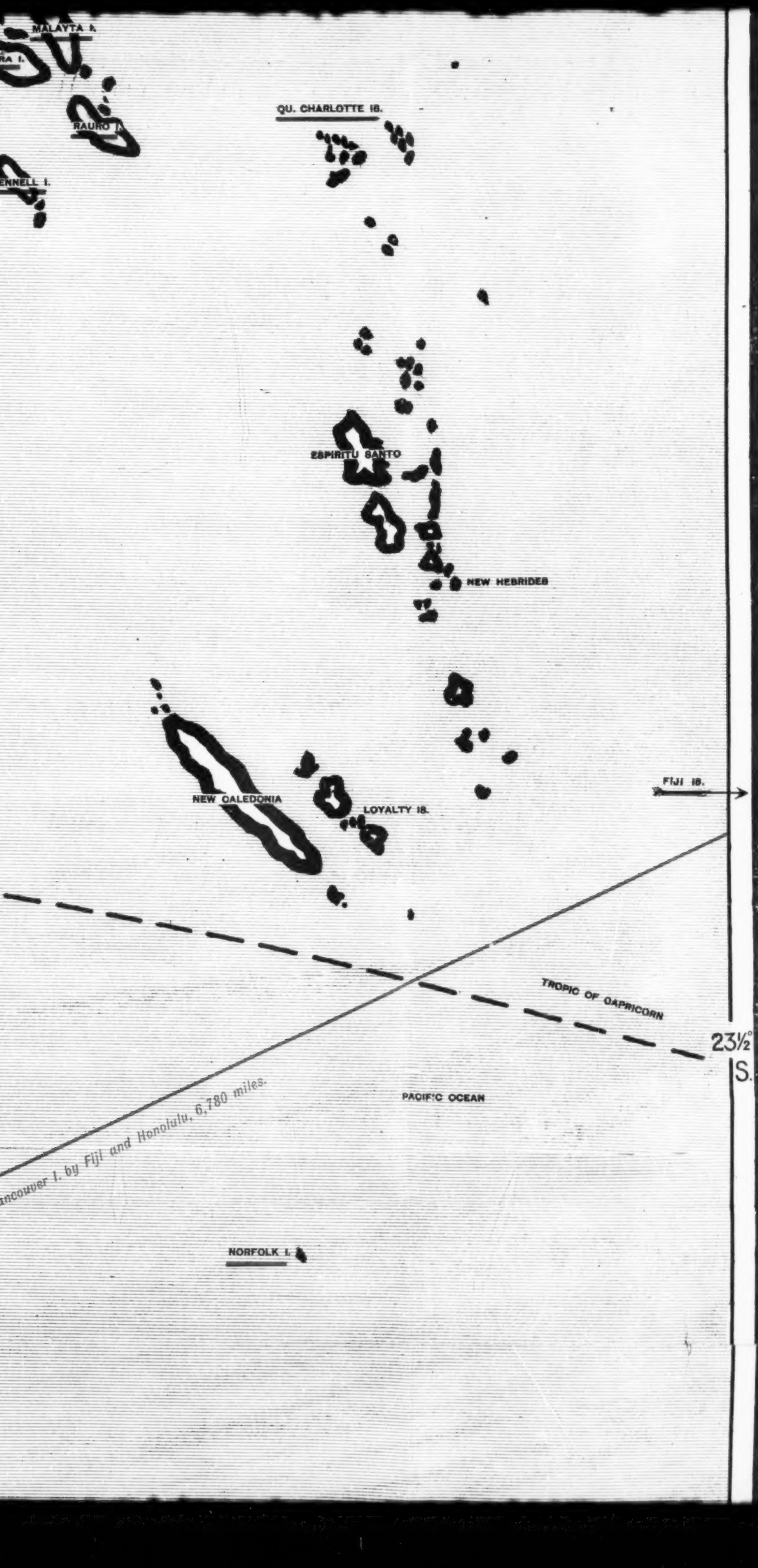
RAURO I.

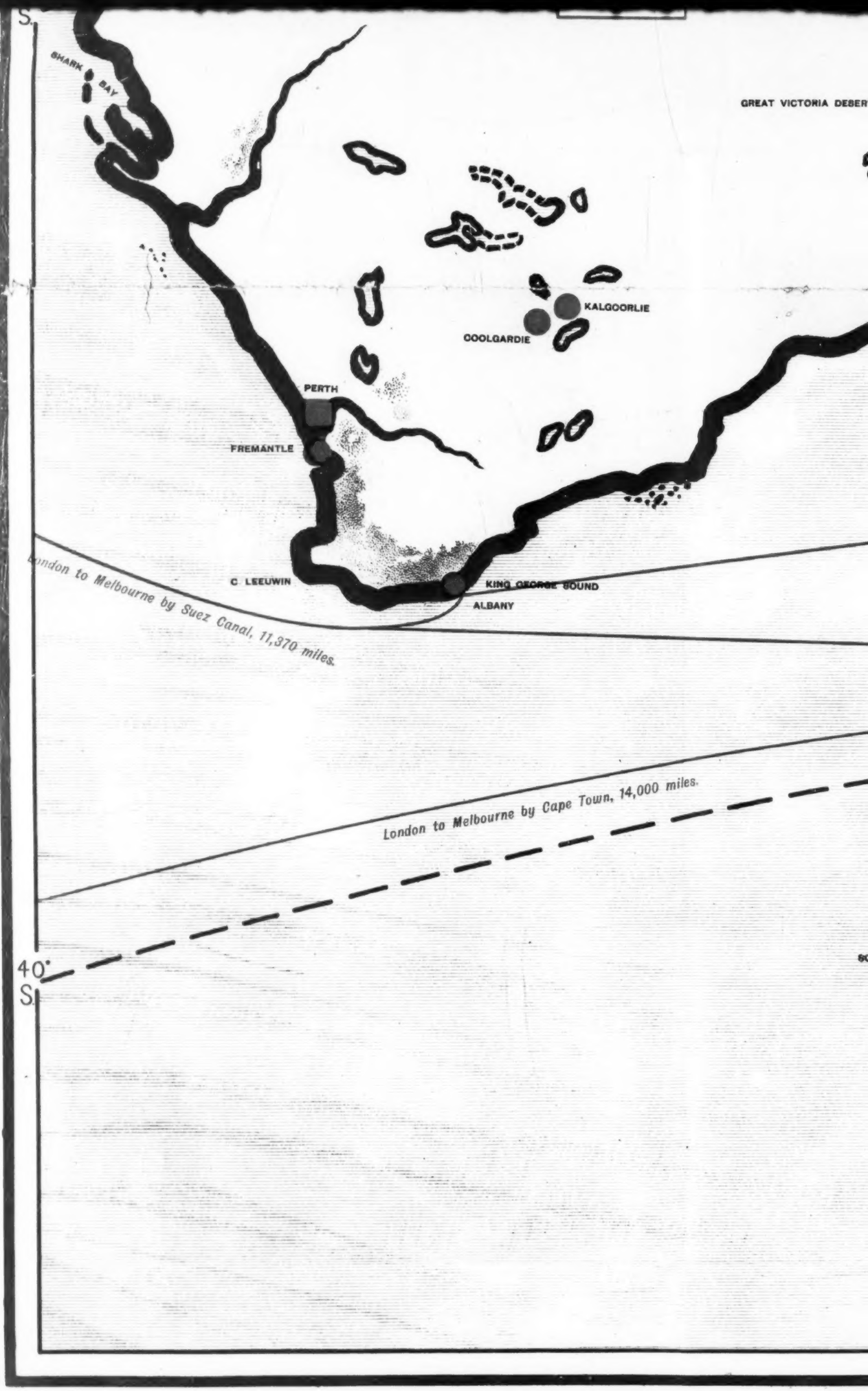
QU. CHARLOTTE IS.


SUMBAWA I.
SUMBA I.
TIMOR SEA
PORT DARWIN
QUEENS CHAN.
ADMIRALTY G.
KING SOUND
DAMPIER LD.
INDIAN OCEAN
GREAT SANDY DESERT
DAMPIER ARCH.
NORTH-WEST CAPE
23½° S.
WEST AUSTRALIA
SHARK BAY
GREAT VICTORIA DESERT
KALGOORLIE
COOLGARDIE
PERTH
FREMANTLE


MELVILLE I.
PORT DARWIN
PALMERSTON
C. ARNHEM
ARNHEM LAND
GR. EYLANDT
GULF OF CARPENTARIA
CAPE YORK PEN
L. AMADEUS
WARBURTON R.
COOPER CREEK
L. EYRE
SOUTH AUSTRALIA
DESERT
L. TORRENS
BROKEN HILL
NULLARBOR PLAIN
L. GAIRDNER
PORT AUGUSTA
EYRIA PEN.
PORT PIRIE
BURRA-BURRA
GREAT AUSTRALIAN BIGHT
ADELAIDE
R. MURRAY
SPENCER G.
KANGAROO I.
BENDIGO
ENCOUNTER B.

SOUTH CAPE
LOUISIADE ARCH.
MALAYTA I.
GERA I.
RENNELL I.
C. MELVILLE
CORAL SEA
GREAT BARRIER REEF
HALIFAX H.
TOWNSVILLE
PORT DENISON
ROCKHAMPTON
HERVEY B.
C. SANDY
MARYBOROUGH
GR. SANDY I.
GYMPIE
DARLING DOWNS
MORETON B.
BRISBANE
WARREGO R.
DARLING R.
TOOWOOMBA
IPSWICH
C. BYRON
Sydney to Vancouver I. bu
LIVERPOOL RA.
NEW SOUTH WALES
LORD HOWE I.
MAITLAND
BATHURST
BLUE MTS.
NEWCASTLE
LACHLAN R.
SYDNEY
MURRUMBIDGEE R.


MALAYTA I.
RA I.
RAURO I.
ENNELL I.
QU. CHARLOTTE IS.
ESPIRITU SANTO
NEW HEBRIDES
NEW CALEDONIA
LOYALTY IS.
FIJI IS.
TROPIC OF CAPRICORN
23½°
S.
PACIFIC OCEAN
ncouver I. by Fiji and Honolulu, 6,780 miles.
NORFOLK I.


S.
SHARK BAY
GREAT VICTORIA DESER
KALGOORLIE
COOLGARDIE
PERTH
FREMANTLE
C. LEEUWIN
KING GEORGE SOUND
ALBANY
London to Melbourne by Suez Canal, 11,370 miles.
London to Melbourne by Cape Town, 14,000 miles.
40°
S.

SOUTH AUSTRALIA
VICTORIA DESERT
NULLARBOR PLAIN
GREAT AUSTRALIAN BIGHT
L. EYRE
L. TORRENS
L. GAIRDNER
BROKEN HILL
PORT AUGUSTA
EYRIA PEN.
PORT PIRIE
BURRA-BURRA
ADELAIDE
R. MURRAY
SPENCER G.
KANGAROO I.
ENCOUNTER B.
BENDIGO
BALLARAT
GEELONG
CAPE OTWAY
SOUTHERN OCEAN
130°E.

AUSTR

TOOWOOMBA

IPSWICH

C. BYRON

DARLING R.

NEW SOUTH WALES

LIVERPOOL RA.

MAITLAND

RIVERINA DISTRICT

BATHURST

BLUE MTS.

LACHLAN R.

NEWCASTLE

SYDNEY

MURRUMBIDGEE R.

GOULBURN

R. MURRAY

VICTORIA

AUSTRALIAN ALPS

GR. DIVIDING RA.

MELBOURNE

C. HOWE

GEELONG

PORT PHILLIP

WILSON PRO.

BASS STR.

KING I.

FURNEAUX IS.

LAUNCESTON

TASMANIA

HOBART

SOUTH CAPE

LORD HOWE I.

Sydney to Vancouver I. by

Sydney to Wellington, 1,260 miles.

Melbourne to London by Cape Horn, 13,87[illegible] miles.

WEST CAPE

FOVEAUX STR.

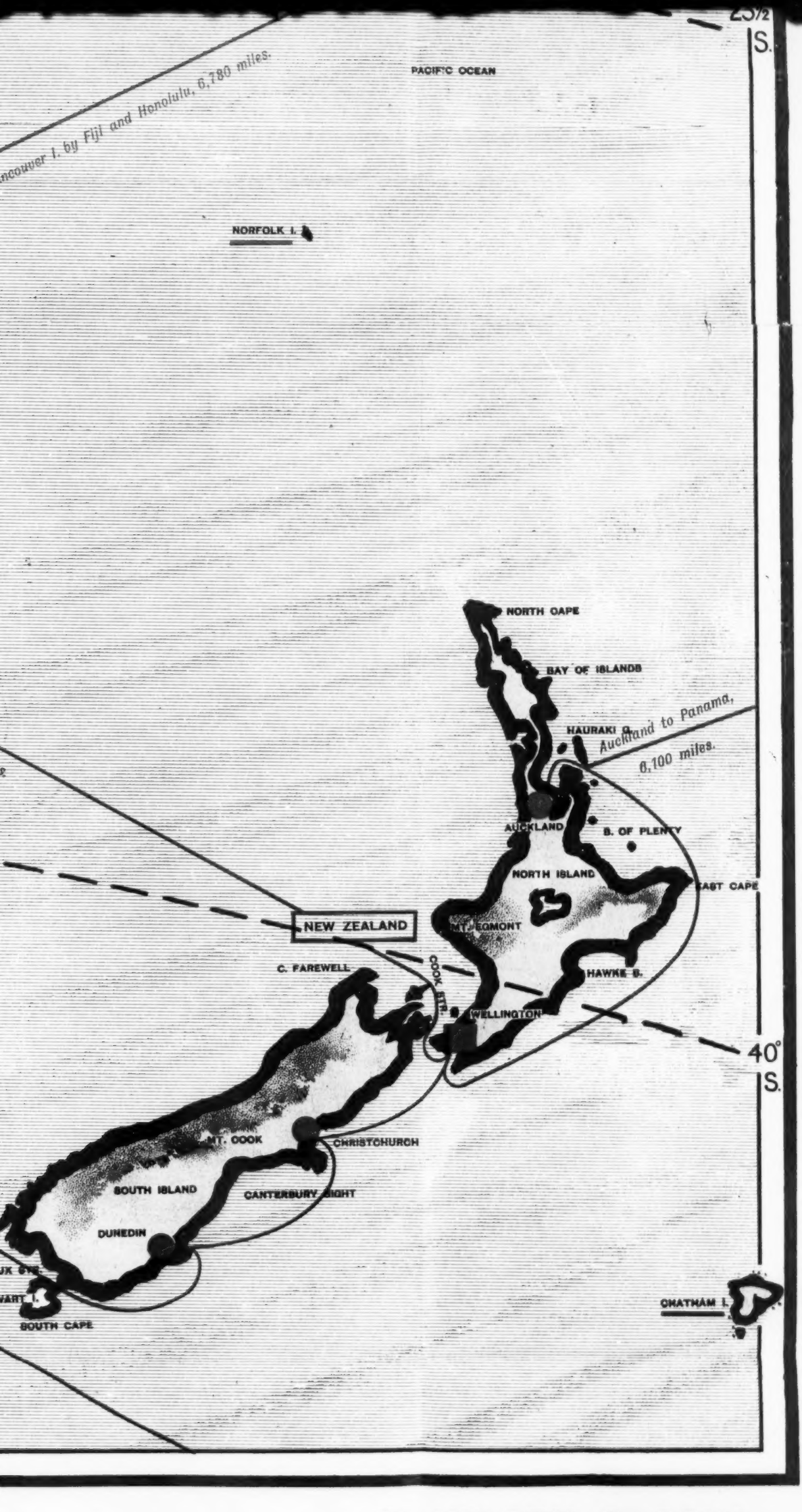
STEWART I.

SOUTH CAPE

160° E.

BRITISH
1 MY 1901
MUSEUM

RALASIA



T. NELSON & SONS.

DAY TRAINING COLLEGE,

White St., Finsbury St., & Ropemaker St., Moorfields, LONDON, E.C.

Approved by the Education Department, and recommended by H.M. Inspectors.

Principal—PROFESSOR CUSACK.

Pupil Teachers' Department.

ORAL CLASSES.

SATURDAY CLASSES. Both Morning and Afternoon. The P.T.'s in these Classes also attend on Wednesday Evening and one Morning weekly.

AFTERNOON CLASSES. The P.T.'s in these Classes do not attend on Saturday, but attend three Afternoons per week.

CORRESPONDENCE CLASSES. For Pupil Teachers of all years who cannot attend the Oral Classes.

The P.T.'s, whether in Oral or Correspondence Classes, are taught in separate Classes according to year; those of each year are subdivided according to whether their Exams. fall in April or October, and taught in separate Classes.

SCHOLARSHIP CLASSES

form a separate series entirely from Candidates, 1st and 2nd Year P.T.'s. New Classes, both Oral and Correspondence, are formed each year in October, January, April, and at other times. Correspondence Papers are sent out every Wednesday, except during the usual holidays.

Quarterly Examinations of Pupil Teachers

(As required by Paragraph 7, Circular 345)

are now conducted. The Fee for Examination is 2s. each P.T. each time of Examination, or 6s. per year. Graduated Syllabus of Course of Study and Examination is supplied gratis.

CERTIFICATE CLASSES.

New Classes, both Oral and Correspondence, are formed each year, about 1st April, 1st July, 1st Sept., 1st Nov., 1st Jan., and at other times.

CORRESPONDENCE INSTRUCTION

is also given in preparation for the Science and Art (May Exams.), L.L.A., Matriculation, Kindergarten, Oxford and Cambridge Senior Locals.

Full particulars, post free, on application to

PROFESSOR CUSACK.

CUSACK'S COPY BOOKS.

Adopted by the School Board for London.

Complete Series in Eight Nos., 1½d. each net. Over 10,000 Schools and many of the Training Colleges now use them.

These Copy Books have been Revised, Re-Engraved, and Adapted to the Standards in all Elementary Schools.

New Series now ready. Application from Head Teachers for Specimen Copies is invited.

The Series is complete in Eight Numbers, as follows:—

Book I.	**Large Hand.**	The whole Alphabet of Small Letters. Combinations of Letters. Short Words.
Book II.	**Half Text.**	The whole Alphabet of Capital Letters. Short Words.
Book III.	**Large Hand and Half Text—Capitals.**	Long Words.
Book IV.	**Capitals and Figures—Sentences.**	
Book V.	**Capitals—Small-Hand Sentences.**	
Book VI.	Do. Do.	Smaller than No. V.
Book VII.	Do. Do.	Smaller than No. VI.
Book VIII.	**Business Letter Writing.**	*Can be had either ruled or unruled.*

Each Book contains Complete Instructions on the Formation of the Letters of the Alphabet.

Set of Cusack's Copy Books for Teachers' use, in one volume, bound in cloth, 1s. 6d. net.

CUSACK'S LEAD PENCIL COPY BOOKS for Infant Schools. Highly approved by His Majesty's Inspectors and the Teaching profession generally. They make writing a pleasure to the Infants, and do not, like slates, assist in the spread of infectious diseases. All Teachers of Infant Schools should write for specimen free copies.

CUSACK'S WRITING BOOKS (Blank).

For Blackboard Lessons.

Ruled to match Cusack's Copy Books. 1d. each net.

CITY OF LONDON BOOK DEPOT,

White St. & Finsbury St., Moorfields, London, E.C.

Now Ready. ***Coloured Supplement Presented with this Number.*** **Price 3d.**

MAY NUMBER OF THE

Practical Teacher's Art Monthly.

Official Organ of the National Association of Manual Training Teachers; and of the Educational Handwork Union.

FULLY ILLUSTRATED CONTENTS.

THE MONTH: Merry May.

A DAY AMONG THE GREEK VASES IN THE BRITISH MUSEUM (*Continued*). By W. E. Sparkes.

NATIONAL ASSOCIATION OF MANUAL TRAINING TEACHERS.

THE DAILY ROUNDS OF A DRAWING INSPECTOR.

ANSWERS TO SOUTH KENSINGTON EXAMINATIONS. Design: Elementary Stage.

THE INTRODUCTION OF HANDWORK INTO SCOTCH SCHOOLS (*Continued*). By G. F. Duncan.

FLORAL DESIGN FOR ELEMENTARY SCHOOLS.

M. GUILLAUME'S REPORT ON THE ENGLISH SECTION OF PARIS EXHIBITION.

EXHIBIT OF AMERICAN SCHOOL-WORK IN MANCHESTER.

NOTES ON THE NEW PERSPECTIVE SYLLABUS (*Continued*). Shadows.

SOLUTION TO TEST PAPER IN PERSPECTIVE DRAWING.

THE ART EXAMINATIONS OF 1900. Extracts from the Reports of the Examiners.

SUMMER COURSE IN DRAWING AND MANUAL TRAINING AT AMBLESIDE.

EDITORIAL NOTES The May Examinations in Art—The Scotch Code and Drawing.

WOODWORK FOR SMALL SCHOOLS. By J. Spittle, Organiser of Manual Training to Huddersfield School Board.

Order from your Bookseller now.

Annual Subscription by post, including all Supplements, 4s.

THE PRACTICAL TEACHER OFFICE:

THOMAS NELSON AND SONS, 35 and 36 Paternoster Row, LONDON, E.C.

BLACKIE & SON'S NEW LIST.

Geography through Object Lessons.

THE NEW CENTURY GEOGRAPHY READERS.

Beautifully Illustrated with Coloured Pictures and Coloured Maps.

A New Series—new both in manner and in matter.

The books are brightly written. The first two volumes are concerned chiefly with elementary notions in geography, and those principles of physical science that bear directly upon geography. The earlier lessons are taught largely through conversation and fable. Notes of Object Lessons corresponding to the lessons of the first three books are given in Frew's "Object Lessons in Geography."

The whole series is copiously illustrated with pictures in colours and in black and white. In all the books, from the Third upwards, geographical synopses with many coloured maps are supplied.

First Book.—Geography and Common Things. Part I. (First Notions in Geography, Cardinal Points, Plan, Map, Lessons on Common Things.) 10d.

Second Book.—Geography and Common Things. Part II. (Geographical Terms, Physical Geography of Hills and Rivers, Size and Shape of the World.) 1s.

Third Book.—Industrial England. (Physical and Political Geography of England and Wales.) 1s. 2d.

Book IVa.—The British Isles, and Glimpses of Greater Britain. 1s. 6d.

Book IVb.—The British Isles and Europe. 1s. 6d.

Book IVc.—The British Isles. (This book appears also in the Raleigh Geography Series.) 1s. 6d.

OBJECT LESSONS IN GEOGRAPHY AND SCIENCE. By David Frew, B.A., F.E.I.S. In Three Parts. 1s. 6d. each.

T. G. Rooper, H.M. Inspector of Schools, says:—"An excellent book on teaching geography through object lessons."

BLACKIE'S CONTINENTAL GEOGRAPHY READERS.

A series of five books dealing with the Continents individually. The lessons are couched in simple but picturesque language; breadth of treatment rather than minuteness of detail has been aimed at. Each book is provided with an up-to-date Synopsis of the Geography, illustrated with numerous **Coloured Maps.** The Reading Lessons are plentifully illustrated with Sketch Maps.

EUROPE.—The Physical, Political, and Commercial Geography of the various European Countries. 1s.

ASIA.—The Physical, Political, and Commercial Geography of the various Asiatic Empires and States. 1s.

AFRICA.—The Physical, Political, and Commercial Geography of Africa. 1s.

AMERICA.—The Physical, Political, and Commercial Geography of North, Central, and South America. 1s.

AUSTRALASIA.—The Physical, Political, and Commercial Geography of the Commonwealth of Australia, of New Zealand, and Oceania. 1s.

Geography and Common Things.

THE RALEIGH GEOGRAPHY READERS.

A composite course of lessons on Geography and the Science of Common Things. Books I., II., III. deal with natural objects, such as animals, plants, common minerals, water, clouds, etc. Book IV. provides a simple introduction to general geography. Book V. covers the British Isles, and Book VI. the British Empire. Book VII. is a highly *readable* introduction to commercial geography, and forms a necessary conclusion to any course of geography.

Book I.—Nature-Knowledge. Part I. 10d. Or, Tales and Talks on Common Things. Part I. 8d.

Book II.—Nature-Knowledge. Part II. 1s. Or, Tales and Talks on Common Things. Part II. 10d.

Book III.—Nature-Knowledge. Part III. 1s. 2d. Or, The Young Scientists. 1s.

Book IV.—Introductory Geography—Geographical Terms, etc. 1s. 6d.

Book V.—Geography of Great Britain and Ireland. 1s. 6d.

Book VI.—Geography of Greater Britain. 1s. 9d.

Book VII.—A Brief Introduction to the Commercial Geography of the British Empire and the United States. 1s. 9d.

The School Board Chronicle says:—"If No. V. be taken for a fair example of the series, this will be one of the best sets of Geography Readers yet placed at the service of our schools."

BLACKIE'S CLASS BOOKS OF GEOGRAPHY.

Tabular Synopsis of the Geography, with Coloured Sketch Maps.

No. 1. Introductory Geography. (Without Maps.) 1d.

No. 2. The British Isles. 16 Maps. 3d.

No. 3. England. 4 Maps. 2d.

No. 4a. The British Isles, and Glimpses of Greater Britain. 16 Maps. 3d.

No. 4b. Europe, including the British Isles. 20 Maps. 4d.

No. 5. Europe. 16 Maps. 3d.

No. 6. Asia. 15 Maps. 3d.

No. 7. Africa. 12 Maps. 3d.

No. 8. America. 16 Maps. 3d.

No. 9. Australasia and Geography of the Sea. 8 Maps. 3d.

No. 10. The British Empire. 16 Maps. 3d.

No. 11. A Summarised Commercial Geography of the British Empire. 16 Maps. 4d.

Class Books 1, 2, 4a, 4b, 3 correspond respectively to New Century Geography Readers 2, 3, 4a, 4b, 4c.
Class Books 5, 6, 7, 8, 9 correspond to Blackie's Continental Geography Readers.
Class Books 1, 2, 10, 11 correspond respectively to Raleigh Geography Readers 4, 5, 6, 7.

The best equipped, most purely Literary, and most highly Artistic Series.

THE PALMERSTON READERS.

Beautifully Illustrated with Pictures in Colour.

THE PRIMERS. First Primer, 4d.; Second Primer, 5d.; Infants' First Reader, 6d.; Infants' Second Reader, 7d.

THE READERS. First Book, 9d.; Second Book, 10d.; Third Book, 1s.; Fourth Book, 1s. 4d.; Fifth Book, 1s. 6d.; Sixth Book, 1s. 6d.

THE HOME-LESSON BOOKS. No. I., 1d.; II., 2d.; III., 3d.

THE READING SHEETS. Pages 2 to 17 of the First Primer; 16 Sheets printed in bright colours, on strong manilla, 29 by 37 inches. Mounted on roller. 12s. per set.

Complete Instruction in English.

BLACKIE'S

HANDBOOKS OF ENGLISH.

These little books have proved immensely popular. They provide *complete material* for lessons in English, and contain **Poetry for Recitation, Lessons and Exercises in Grammar, Exercises in Composition, Lessons in Spelling and Word-building, Dictation Exercises for Preparation.**

Book I.	Paper, 2d.	Book IV.	Paper, 4d.
Book II.	,, 3d.	Book V.	,, 5d.
Book III.	,, 3d.	Book VI.	,, 6d.

Cloth covers, 1d. extra.

ENGLISH COMPOSITION THROUGH PICTURE AND OBJECT LESSON.

In Three Parts. Price 2d. each.

These little books are designed to assist in the co-ordination of the teaching of English Composition with the ordinary Object Lessons and Reading Lessons. Common objects of everyday life are the basis of the lessons, which go hand in hand with the readings on the same objects given in the Newton Readers I., II., and III. (*List on application.*) Notes on Composition for the teacher's use are being incorporated in the corresponding lessons in the Newton Object Lesson Handbooks, thus completing the link between the Composition Lesson, the Object Lesson, and the Reading Lesson.

THREE-TERM SCRIPT-FIGURE ARITHMETICS.

Well graduated—well grouped—well selected—Concrete Sums.

In this new series the work is divided among three terms, as recommended by the Board of Education, and the examples and exercises are printed in figures specially made, representing the figures that one actually writes on the blackboard or slate. The exercises are progressively arranged, and only one point of difficulty is taken up in each exercise.

No. I.	1d.	No. IV.	2d.
No. II.	1d.	No. V.	3d.
No. III.	3d.	No. VI.	In preparation.

GRADED DRAWING FOR INFANTS AND JUNIOR CLASSES.

By Miss Anne E. Roberts.

A new and useful book for the teacher of drawing to Infants and Junior Classes. Supplied with drawing subjects and ample hints for procedure. The book comprises *Hints and Examples for Drawing from Dictation or Blackboard; Hints and Examples for Drawing from the Concrete; Hints and Examples for First Steps in Design.* Printed in black and colour. Foolscap 4to, cloth boards, 2s. 6d.

BLACKIE & SON, LIMITED, 50 OLD BAILEY, LONDON.

COUPON
PRACTICAL TEACHER
May 1901.

Printed and Published by Thomas Nelson & Sons, Proprietors, at the Office of "The Practical Teacher," 35 & 36 Paternoster Row, London, E.C.

BRITISH MUSEUM 1 MY 1901